WHAT OUR GIRLS OUGHT TO KNOW.

BY

MARY J. STUDLEY, M.D.,

GRADUATE, RESIDENT PHYSICIAN, AND TEACHER OF THE NATURAL SCIENCES IN THE STATE NORMAL SCHOOL, FRAMINGHAM, MASS.;

ALSO,

GRADUATE OF THE WOMAN'S MEDICAL COLLEGE OF NEW YORK: DR. EMILY BLACKWELL, SECRETARY OF THE FACULTY; DR. WILLARD PARKER, CHAIRMAN OF THE BOARD OF EXAMINERS.

"A perfect woman, nobly planned,
To warn, to comfort, and command;
And yet a spirit still, and bright
With something of an angel light."

LIBRARY OF CONGRESS
COPYRIGHT
JUN 15 1882
No. 9740
CITY OF WASHINGTON.

NEW YORK:
FUNK & WAGNALLS,
1882.

HQ 1229
.S92
RA778
S92

Copyright,
By Funk & Wagnalls,
1882.

AN INTRODUCTORY MEMOIR

— OF —

Dr. Mary J. Studley.

There is no study so interesting to man, as man; hence it is that the biographies of eminent men and women are more sought after than any other kind of literature. An interest is taken in them in proportion to what they have done or written, which have added to the world's store of learning, civilization and entertainment. Biography introduces us to all great men as friends, enhances our estimation of character, and transfuses the life of the departed into us. Great characters, like great mountains, are best seen at a distance; we do not, therefore, as a general thing, form a true estimate of them until we lose them. It is so with many other things. We have to be deprived of them before we learn their value. We see most of the bird's beauty when it stretches its wings for flight.

In this brief sketch of the life of Dr. Mary

J. Studley we can only speak of her public character. Like most struggling women, she had a side that was hidden from the world; and there was, at times, a pressure upon her mind which none would have suspected, who only saw the exterior of the calm, sweet, gentle woman that she was.

Dr. Studley was born in Worcester, Massachussetts, about the year 1835. She was the daughter of parents who were able to give her more advantages in early life than commonly fall to the lot of young women. She was educated at Newton, in her native State, and early developed a thirst for those branches of education which most girls pass over. She acquired a thorough knowledge of Latin, mathematics, natural history and physiology, to which, later on, she added the German and French languages—in the first of which she could speak and write with great fluency. No State has furnished so many female teachers as Massachussetts; and, being full of ambition and independence, she enlisted in that high and honorable calling, locating herself at Sandusky, Ohio, where she proved her stability, worthiness and fidelity, by remaining there twelve years—all the time engaged in the education of youth. At the end of this time family inducements brought her to New York, where she lived four and a half years in the

family of her brother. It was about this time that she resolved to study medicine and become a physician. With her to resolve was to do; and at once she entered the Woman's Medical College of the New York Infirmary, and took a full course, graduating with honor. The first experience of Dr. Studley as a physician was at Elizabeth, New Jersey. She went there, if not absolutely a stranger, still without the assistance so essential to new beginners in the profession. It was with her an experiment, and her hopes came from confidence in herself—her splendid health and buoyant spirits. She had to contend with ignorance, apathy, and settled physicians of experience and skill, who, like most practitioners in medicine, were jealous of and unfriendly to new comers—especially towards a woman, unknown, unheralded and but newly graduated.

A young lawyer advertises himself, and waits long for a first client, but what is that to a woman with the popular prejudice against her sex, and with questions of life and death to be submitted to her skill? Dr. Studley, with womanly trust, put a modest card in the papers, placed her sign upon the house, and waited for her first patient. It may be readily believed that she had abundant leisure; but, she did not waste her time. As we have seen she had obtained much and varied learning, and she had withal a vigorous and

versatile pen. Her strength was in her clear-headed, common-sense, and the gift of expressing her thoughts in good English, never saying too much or too little. With a wise calculation of the charms of attracting popular attention she resolved to lecture on the subject of physiology, first delivering a few lectures to a promiscuous audience, and then a course exclusively to ladies. Her first lecture was delivered to between fifty and a hundred curious listeners; with whatever feelings they came, they went away satisfied that she knew how to treat her subject with masterly skill. Her experiment as a lecturer was successful and satisfactory. If patients came in slowly, they did come; so that by the end of the first year Dr. Studley was a self-supporting woman, with the prospect of a fair share of the practice of the city.

More than fifteen years of teaching, however, had formed habits which could not be wholly overcome; and although she labored zealously in her own profession, there was always an undercurrent of longing for the teachers desk and inquiring students. A quiet city like Elizabeth did not satisfy her ambition; and after a residence of about two years she left it and located in New York city, where every thing had to be begun anew. She met difficulties and obstacles with womanly determination, lecturing as before and

using all legitimate means to achieve success; but Providence had decreed that she should occupy a wider and more congenial field of usefulness. Taking better counsel than that which carried her to New York, she returned to Massachussetts, and for a while practised medicine in her native city, Worcester, where she had many friends who gladly welcomed her home. She next was offered and accepted a position in the State Normal School, at Framingham, as Professor of the Natural Sciences, and as Resident physician. Here, she was indeed at home. Her studies in medicine had not been lost; they had rounded out her talents as a teacher, they had widened her knowledge of human nature, and all her faculties were fully developed. This was, undoubtedly, the Summer period of her life. She was to her scholars, what Mentor was to Telemachus—a guide, a counsellor and a friend—and they loved her as such.

Twice she visited Europe, each time in company of a party of young and eager travelers and students, and furnished some interesting letters to the *Newark Advertiser*, giving graphic accounts of their travels. From her last trip she returned with somewhat impared health, the result of over-fatigue and anxiety, from which she never fully recovered. She became nervous and restless; and some action on the part of the man-

agers of the Normal School, of which she did not approve, led to her resignation, and temporary loss of employment. Unwilling to return to the practice of medicine she finally opened a private school in Framingham, which opened with every promise of success and abundant returns in reputation and money. But, alas! a cloud may suddenly obscure the brightest sky; so it sometimes happens, that what seems to be the hour of triumph becomes the hour of affliction.

> "Death comes to all, his cold and sapless hand
> Waves o'er the world, and beckons us away.
> Who shall resist the summons?"

The strain upon the great heart of the strong woman had been too long endured; the fatigue of body and mind had been excessive; and even as a host of loving friends and relatives were rejoicing over the new departure, and eager scholars were waiting her words of wisdom and sympathy, the Angel of Death claimed her as his own. There was but a momentary struggle, the light fled from the eyes, the firm lips closed, and the spirit of Mary J. Studley was before the throne of the Creator.

In character, Dr. Studley mingled strength and tenderness. She was fearless in the discharge of her duty, and her life was full of heroic self-sacrifice, and rich in noble deeds. In her off-hand talks to her scholars or assemblies, she

would draw upon her exhaustless fund of humor, creating ripples of laughter; and with the door thus opened, and the attention gained, she would crowd into their minds a wonderful amount of information. She had a large head, a round face, with honesty written in every line of it, and bright sparkling eyes, with a sweet clear voice. She was warm in her friendships, and loved the society of intelligent people. If she had her failings, which is not improbable, she had a wonderful way of hiding them from all but herself and her God.

As a writer, this little volume is a fair example of her style and versatile powers. Her love for the young was great, and she had a strong desire to contribute all in her power to the mental and physical developement of her own sex. This volume will be found to contain a large store of illustration and information, showing the extensive and varied character of her own studies. Dr. Studley has left other manuscripts behind her which deserve to, and which we trust may, some day, be permitted to reach the public.

J. K. HOYT.

June 1, 1882, Newark, N. J.

PREFACE.

Said Confucius: "If I am building a mountain, and stop before the last basketful of earth is placed on the summit, I have failed of my work. But if I have placed but one basketful on the plain, and go on, I am really building a mountain."

This is my little basketful of earth which I bring to the ever-growing mountain of literature upon education. "There cannot be, on such an inexhaustible subject, one book too much, even after the best—except the worst."

In my basketful you will find some grains of simple truth which I have picked up "along the shore of the great ocean." I have set them among gems from Homer, from Moses, from Solomon, from Plato, from Jesus, and

from many modern poets, philosophers, and teachers, and now they are yours, dear girls, for whom they have been collected. May they help you "to do and to become your best"!

M. J. S.

State Normal School,
Framingham, Mass., *Jan.*, 1878.

CONTENTS.

PAGE

PREFACE iii

INTRODUCTORY 5

CHAPTER I.

"STUDY GOD'S POEM" 12

CHAPTER II.

"KNOW THYSELF" 26

CHAPTER III.

WHAT SHALL WE EAT, AND HOW SHALL WE COOK IT? 42

CHAPTER IV.

THE HEART 54

CHAPTER V.

HOW WE BREATHE 68

CHAPTER VI.

HOW WE BREATHE.—*Continued* 81

CHAPTER VII.

THE BRAIN AND NERVES 97

CHAPTER VIII.

NERVES AND NERVOUSNESS..... 113

CHAPTER IX.

HOW PLANTS AND ANIMALS ARE PERPETUATED... 134

CHAPTER X.

HOW TO BECOME BEAUTIFUL..... 146

CHAPTER XI.

THE USES AND ABUSES OF DRESS..... 171

CHAPTER XII.

THE MATE AND THE HOME..... 199

CHAPTER XIII.

THE PERFECT WOMAN..... 225

INDEX..... 257

What Our Girls Ought to Know.

INTRODUCTORY.

As vigorous health, and its accompanying high spirits, are larger elements of happiness than any other things whatever, the teaching how to maintain them is a teaching that yields to no other whatever.—HERBERT SPENCER.

HAVING been privileged, for a number of years, to associate with "our girls" in schools both public and private, as a teacher of the laws of health, there have come to me from time to time not a few requests, both from mothers and daughters, for a printed manual of the lessons given in this capacity. These requests have led me to believe that there is room for such a book among the many which seek to make our young women wiser and better.

The higher education of "our girls" is the prominent topic of the day in the press, in the magazine, in the parlor, and on the platform. New colleges are springing up for them, and old ones are gradually opening their doors to them. The nineteenth century is coming to recognize the meaning of what Moses told the world so long ago, when he said God put Eve *beside* Adam, instead of putting her above him or below him, or into a "female seminary" all to herself; and along with this recognition goes the underlying one that a sickly Eve was no more a part of the Divine plan than was a sickly Adam. The record is emphatic and clean upon this point. Sublime in its simple eloquence as is the character of Moses himself, the narrative says, "And God saw everything that he had made, and, behold, it was very good"; but in the years that roll between then and now it appears that there has been a deal of interference with the original "very good" work, until it would hardly seem as if God could recognize his pattern in the sickly, feeble, nervous, jaded, hysterical, worry-faced, and wasp-waisted creature who spends half her time

in telling her aches and the other half in the specialist's office.

It is not strange that this creature should have been refused admission to colleges whose work is planned for sound minds in sound bodies, nor that the world should be slow to believe that she is capable of doing this work; but it happens that, along with the movement toward higher intellectual culture, there is a no less vigorous campaign in behalf of the temple which the soul inhabits, that it may become fit for the Holy Ghost's indwelling If Eve is going to stand beside Adam, where God put her, she must take such care of her body as to insure its being a help rather than a hindrance to her work; and it has been a constant joy during my association with school-girls, in the capacity already named, to find a growing sentiment in favor of that vigorous health which is the prime factor of success in life.

It has long been said by prominent medical men that women themselves are responsible for a large share of their characteristic weaknesses, and the following extract from a note addressed to me by Dr. Willard Parker only echoes the prevailing sentiment of the profes-

sion. He says: "Women kill themselves by their bad management in a mechanical way. They make themselves portable machines for effete matter. Their nerves cry out when fed by a dirty blood, and the cry is called neuralgia. What folly to give an anodyne for the neuralgia and let the cause of it remain!"

It is not strange that the gentlemen of the profession were limited to generalities in their charges against women for maltreatment of their bodies. They never wore the absurd machinery with which the conventionally-dressed woman is deformed, and how could they attack its details or make any real progress toward reform! The real dress-reform necessarily waited to be inaugurated by medical women, and its progress keeps pace with theirs toward popular acceptance. No woman who understands the beauty of the original design of the human body will ever seek to distort that body by subjecting it to the demands of a fashion which is totally regardless of natural laws; it therefore follows, as surely as day follows night, that the women who study medicine are the women who have most respect for their bodies, and who have, therefore, the

soundest and most serviceable bodies—bodies upon which they can count for any amount of intellectual or other work as surely as men can depend upon their bodies.

Says the Rev. Charles Kingsley in his excellent book on "Health and Education": "Let women who have studied medicine teach to other women what every woman ought to know." And long before he said it they were in the field, ready and anxious to carry the gospel of health to their misguided and suffering sisters. Having learned what is causing so much misery among them, they find it difficult to wait in the office for the mischief to be done which they know is so much more easily prevented than cured; hence they go forth to the school and the lecture-room as missionaries and ministers of the goddess Hygeia, the fair daughter who put more faith in correct living than in the charmed serpents of her father Æsculapius.

"The laws of health are the laws of God, and are as binding as the decalogue," is an oft-quoted saying of Dr. Parker's. We take great care to teach the decalogue to our young men and maidens; but are we just to them

when we neglect to teach them what they ought to know about their bodies, in order that they may obey the laws of those bodies?

My experience with "our girls" convinces me that they do not willfully sin against their bodies, but that they are sadly ignorant of the laws which govern them. We all admit that it is the mother's duty to acquaint them with these laws; but it is a lamentable fact that the present generation of mothers is wofully deficient in the ability to do so. They admit it, and are, as a rule, glad to secure the aid of an educated lady physician in supplementing their home work.

And so, dear girls, we come to you, glad to help your mothers teach you what you ought to know. It is the expression of the highest thought of God, this temple which we inhabit!

Plato said to his pupils: "You take a journey to Olympia to behold the work of Phidias, and each of you thinks it a misfortune to die without a knowledge of such things; and will you have no inclination to see and understand those works for which there is no need to take a journey, but which are ready and at hand,

even to those who bestow no pains! Will you never perceive what you are, or for what you are born, or for what purpose you are admitted to behold this spectacle!"

"Phidias worked on marble, and the light of his creation still beams from afar. Raphael worked on canvas, and gave to the world a beauty which has thrilled hearts through all these ages. What shall we fashion, who work upon the breath of God?"

CHAPTER I.

"STUDY GOD'S POEM."

"Thou need'st but eyes rightly to see his work,
A soul, a soul to understand it all,
A heart to feel it simply as it is:
How will the loving soul thrill through thee then,
Which he has breathed into the eternal work,
Into the beauteous face of man and flowers!

. . . . . .

It becometh man to understand
What God doth speak out loudly through his works."

—Leopold Schefer.

"And the Lord God formed man of the dust of the earth, and breathed into his nostrils the breath of life."

—Moses.

You can find this "dust of the earth" very easily by putting any bone into the fire long enough for its animal matter to be separated from its earthy constituents, and then your

knowledge of chemistry and mineralogy will tell you that the dust into which the bone resolves itself is just the same dust which goes to make the marble of the Venus de Milo, the coral which you wear over your heart, the jewel which sparkles on your finger, or your plaster cast of Psyche.

I once had a little black girl in a Sunday-school, who, in reply to the question, "Of what are you made?" said, "Mud, ma'am." And she was no less accurate than Moses; for you know you have learned that three-fourths of your body consist of water, and we all know that dust and water make mud. And do you know what becomes of the dust which remains when the bone is burned? Some of this "dust" is called phosphate of lime, and the farmers put it on the fields, that you may get it for your own bones in the form of corn and beans and wheat, while the match-makers (I mean Lucifer matches) also take a share of it to use in their factories. It is said that each one of us carries about in her skeleton enough phosphorus, in the form of phosphate of lime, to make four thousand matches.

Other portions of the "dust" which com-

poses the bones are called carbonate of lime; and when we have spent "our years as a tale that is told," it is quite possible that this dust of ours may reappear as a handsome coral spray to adorn the maidens who shall come after us. Besides the phosphate and carbonate of lime, there is a bit of fluoride of lime in our bones, and this may have existed in some gem which has sparkled in the crown of an emperor, so wisely does Dame Nature economise her resources. She has, as you know, but sixty-three elements to work with, and she has to turn and twist and hash and warm over her odds and ends, over and over and over again, in order to keep all her ovens supplied. These, then, are the main elements which go to make the dust of your bones—phosphate, carbonate and fluoride of lime—and the bones of your pet kitten are made of the same substances. Not only this, but she has about the same number of bones that you have, for is she not a first-class creature, a vertebrate? Do you know how a vertebra looks? If not, let me beg you to go to the meat market at once and learn just how that column of little bones looks of which your "spine" consists. Look,

too, at the nice little cushions between the vertebræ by which all the vertebrates except the poor turtle and the corseted woman secure such flexibility of the spinal column as constitutes the grace of motion.

Have you seen the inner surface of a turtle's back, and how all the vertebræ are consolidated so that the creature can no more execute a graceful movement than you could if you had to carry your house on your back? Mythology tells us that the turtle alone of all the animals refused to attend the wedding of Jupiter and Juno, and that for this slight the latter condemned her to forever carry her house on her back. I wonder what offense those women are expiating who hold their vertebræ in the manner of the turtle by means of "stays?" It hardly seems possible that any animal would voluntarily put itself under such restraint.

Have you ever observed the beautiful adaptations of the parts of the skeleton of a vertebrate to each other and to their uses? If not, let me ask you to go to a Natural History museum at your earliest opportunity, and see what a superb specimen of architecture is presented by this array of bones.

Observe the skull or brain case; if possible, the human skull, since that is the finest of all. How perfect the arch of the dome! How firm, and yet how fine, the sutures or seams where the separate bones unite! How strong and able to resist the shock of falls is the occiput, or backbone! Compare its thickness with that of the bones which form the eye-sockets, and see with what nicety the requisite strength is secured at this point by thin bones, which are almost transparent, and have no need to be thick to resist shocks such as the back of the skull is liable to receive. Look then into the nostrils, and see those fine and beautifully twisted bones which are so nicely adapted to increasing the space over which the air has to pass on its way to the lungs, that it may be warmed and fitted for introduction into such choice company as the air-cells of the lungs afford. Not only this, but also an increase of space for the distribution of the nerve of smell is secured. The longer the dog's nose and the more twisted these turbinated bones, as they are called, the keener is his sense of smell. And why not for you? The *nez retroussè* may possibly add to the saucy prettiness of the face which it matches, but for

real service and as a mark of high breeding the aquiline and the Roman noses can hardly be excelled. A strongly-built nose and a chin which does not retreat as if anxious to get out of sight are proofs of a well-built skeleton.

The houses built with hands soon fall into hopeless ruin if the frames be of poor timber, poorly jointed, and the same is true of the house each of us lives in and which Paul asks us to call a temple for the Holy Ghost's indwelling. I don't believe the Holy Ghost will ever make his home in a poorly-built house. He may make it occasional missionary visits, and then the soul may shine out of it with a luster which is truly surprising; but he doesn't, as a rule, take up his abode there. Infinitely better than an inheritance of bank stock with a poor house-frame is a well-built house without the bank stock, for if our parents give us the latter we can know the luxury of winning our own dollars and spending them, too; while in the former case we can only lie about in helpless impotence and see our bank stock going to enrich the doctors. Says Mr. John Burroughs: "I notice that when a family begins to run out, it turns out its toes, drops off at the heel, shortens

its jaw and dotes on small feet and hands." What's to hinder a structure from going to ruin when the corner-stones give way!

Look now at the thorax or chest. See what a perfect cage it is for the protection of its occupants, and how light and airy it is at the same time. Strength joined with lightness and elasticity sufficient for perfect freedom of motion of all its parts. See how beautifully the round head of each rib fits into the little socket prepared for it, and which in life is so nicely lubricated that the constant motion of each head in its socket is unnoticed, although each rib rises and falls with every breath; that is, when it is not held in splints by that instrument of torture which one sees in all the shop-windows, labeled "Patent glove-fitting," a machine which has been the cause of more misery to women than any other one thing. I sometimes think that Moses' account of Eve's eating the fatal apple and then running for a fig-leaf refers to her putting on a corset and the abominations which hang thereby.

Believe me, dear girls, you cannot compress the walls of this delicate cage without paying the penalty in ways which you would never

suspect. The corner-stone of a house may crumble away and never be noticed till the tower falls over, and so you may undermine your foundation by crowding your chest bones upon each other, and the head alone will utter its protest by aching. That is the tower falling over.

Look now at the complexity of the framework of the wrists and the ankles, the hands and the feet. Note that it takes eight little bones in the wrist, all of them so adjusted and lubricated as to move upon each other in most exquisite nicety, so that the movements of the human hand have no parallel in the universe for beauty and variety. What do you suppose the Author of all this mechanism thinks when he sees a string of bangles hung on it!

Look at the foot with its marvelous array of bones, all adapted for motion by the most perfect system of joints which could possibly be made, and tell me what the maker of it must think when he sees that complex and beautiful instep tipped wholly out of its position on a French heel, and those toes folded upon each other in helpless inactivity, not one of them able

to move itself or assert its "inalienable right to life, liberty and the pursuit of happiness."

Says Mr. John Burroughs in his charming little book, "Winter Sunshine," which I hope you all have read or will read, "Occasionally on the sidewalk, amid the dapper, swiftly-moving, high-heeled boots and gaiters, I catch a glimpse of the naked human foot. Nimbly it scuffs along: the toes spread, the sides flatten, the heel protrudes; it grasps the curbing, or bends to the form of the uneven surfaces—a thing sensuous and alive, that seems to take cognizance of whatever it touches or passes. How primitive and uncivil it looks in such company—a real barbarian in the parlor! We are so unused to the human anatomy, to simple, unadorned nature, that it looks a little repulsive; but it is beautiful for all that.... That unhampered, vitally playing piece of anatomy is the type of the pedestrian; man returned to first principles, in direct contact and intercourse with the earth and the elements; his faculties unsheathed, his mind plastic, his body toughened, his heart light, his soul dilated; while those cramped and distorted members in the calf and kid are the unfortunate wretches

doomed to carriages and cushions.... I fear the American is becoming disqualified for the manly art of walking by a falling off in the size of his foot....A small, trim foot, well booted or gaitered, is the national vanity. How we stare at the big feet of foreigners, and wonder what may be the price of leather in those countries, and where all the aristocratic blood is, that these plebeian extremities so predominate. If we were admitted to the confidences of the shoemaker to Her Majesty or to His Royal Highness, no doubt we would modify our views on this latter point, for a truly large and royal nature is never stunted in the extremities; a little foot never yet supported a great character.

"It is said that Englishmen, when they first come to this country, are for some time under the impression that American women all have deformed feet, they are so coy of them and so studiously careful to keep them hid."

Indeed, it seems to me that many of us spend our lives in trying to convince our Maker that he doesn't understand his business. We are averse to the study of his plan of action, and, instead of taking the body as he gives it to us,

and trying to make it conform to his laws, we squeeze it and bind it and tilt it from its erectness, until we are mere caricatures of the Eve whom we pretend to admire in the pictures and statues, but whom we utterly refuse to imitate.

Believe me, dear girls, God knows best how to shape the framework of your soul's habitation so that the light of a healthy, free and happy life shall shine out from its walls and through its windows. Do not, I pray you, distort and fetter it into total deformity, but rather seek to glorify him who made you by becoming gloriously strong.

Mr. Emerson, in his essay on "Beauty," tells us "it is the soundness of the bones that ultimates itself in a peach-bloom complexion; health of constitution that makes the sparkle and the power of the eye. 'Tis the adjustment of the size and of the joining of the sockets of the skeleton that gives grace of outline and the finer grace of movement. The cat and the deer cannot move or sit inelegantly. The dancing-master can never teach a badly-built man to walk well. The tint of the flower proceeds from its root, and the lusters of the

sea-shell begin with its existence.... The felicities of design in art or in works of nature are shadows or forerunners of that beauty which reaches its perfection in the human form. All men are its lovers. Wherever it goes it creates joy and hilarity, and everything is permitted to it. It reaches its height in woman. 'To Eve,' say the Mahometans, 'God gave two-thirds of all beauty.' A beautiful woman is a practical poet, taming her savage mate, planting tenderness, hope and eloquence in all whom she approaches."

And each one of you has the right to be perfectly beautiful by so living that you shall be perfectly healthy. The transient beauty of the hectic flush and the brilliant eye of the dying consumptive are akin to the ephemeral brilliancy of the autumnal foliage, but it is the final flicker of the candle which precedes its extinction.

To be truly beautiful, with the unfading beauty of health and culture of mind and soul which good health make possible, is to grow beautiful as long as you live. What could be finer in the way of a beautiful face than the pictures give us of Martha Washington in her

post-meridian ripeness! Yet how rarely one sees so handsome a face past the age of fifty! It is the exception where it ought to be the rule, and the reason why it is the exception is, because young women have learned so little up to the present time of natural ways of living.

It seems to be characteristic of the reasoning animal to err, while the ones who depend upon instinct are pretty sure to go right.

"But," I hear you ask, "supposing we begin life with sickly bodies, as a direct inheritance from sickly parents. What if our bones are already deformed by rickets, because our fathers and mothers had rickety skeletons, or because they fed us in such wrong ways in our infancy as to make ours so?" Then, I say, go to work and learn what it is which makes rickety bones, and supply those defects in your early diet which have resulted in such deformities. Enough has been written upon this subject to eradicate rickety skeletons from the whole human family, if they would but read and heed.

But, above all things else, if you are one of those unhappy ones whose inheritance is a

frail body which no amount of hygienic care can make sound, I pray you think well before you venture to transmit your frailties to innocent children who ought never to be born. Rather be content to live and die an "old maid," and so a heroine.

CHAPTER II.

"KNOW THYSELF."

THE beautiful youth Charmides, who is also the most temperate of mortals, is asked by Socrates, "What is Temperance?" He answers (1), "Quietness." "But temperance is a fine and noble thing; and quietness, in many or most cases, is not so fine a thing as quickness." He tries again, and says (2) that temperance is modesty. But this, again, is set aside by a sophistical application of Homer: for temperance is good, as well as noble, and Homer has declared that "modesty is not good for a needy man." (3), Once more Charmides makes the attempt. This time he gives a definition which he has heard, and of which he insinuates that Critias is the author: "Temper-

ance is doing one's own business." But the artisan who makes another man's shoes may be temperate, and yet he is not doing his own business. How is this riddle to be explained? ... Critias, in the spirit of Socrates and of Greek life generally, proposes as a fifth definition, Temperance is self-knowledge. But all sciences have a subject: number is the subject of arithmetic, health of medicine: what is the subject of temperance or wisdom? The answer is, that (6) Temperance is the knowledge of what a man knows, and of what he does not know....

In this dialogue may be noted the Greek ideal of beauty and goodness, the vision of the fair soul in the fair body, realized in the beautiful Charmides. — *Jowett's Dialogues of Plato.*

Although Plato, in this dialogue, gives no abstract definition of temperance, it is yet plain that he includes self-knowledge as a prime constituent of that virtue. Another writer says, "Nearly all the evils in life come to us from a want of self-domination," and I am sure you will all agree with both of them.

Let us therefore go on to study ourselves, that we may know how to manage ourselves.

You have learned, in the foregoing chapter, that a variety of elements enter into the composition of the framework of your bodies, and that the various parts of that framework are most nicely adapted to each other and to their respective offices. Your own observation shows you that this bony framework is clothed with a covering of soft tissues, and you also are conscious that a certain number of organs reside in its cavities. These organs you are accustomed to call vital organs, and you are aware that all your powers of thought and action depend upon their harmony of action. That constitutes health. All sickness is discord.

Let us now go on to study in detail the provision made by the Author of all this mechanism for maintaining both its vitality and its harmony. We will begin, if you please, with the provisions for digestion in the simplest forms of animal life, and glance at the beautiful gradations by which we arrive at the most complex apparatus, as it exists in our bodies, by which the constant wear of all

animal organisms is made good, and life and growth maintained.

The general name *Protozoa*, meaning first animals, is applied to a large number of very small, simple, aquatic creatures, too small to be seen by the naked eye, and only visible by aid of the microscope. These little creatures are mere dots of jelly-like tissue, destitute of any apparatus for taking in or digesting food, beyond a set of delicate fringes, called *cilia*, meaning eye-lashes, whose office is to float little particles of food toward them as they swim about in the water. They are not only mouthless, but headless, and one part of their body is just as capable of eating as another. They may be said to get around their food. A very easy way of living, you see, to float around in the water and live on what happens to stick to you, without even the trouble of swallowing. The next sub-kingdom includes all the radiated animals, such as star-fishes, sea-urchins, sea-cucumbers, etc. You can pick up great numbers of star-fishes on the rocks by the seashore at low tide, and if you look carefully in little pools and crevices between the rocks you may find something

that looks like a chestnut-burr. That is a sea-urchin, or *echinus*. Then, if you look at the under surface of the star-fish, you will find a round hole in the center of him. That is his mouth, and quite likely his stomach will be in his mouth, turned wrong side out, as that is a way he has of doing. He is very fond of oysters, raw. He takes one in his arms, shell and all, and thrusts his stomach in the cleft of the valves and sucks out his victim alive. This, you see, is quite an advance upon the protozoan style of eating; but when you look at the under surface of the sea-urchin you will find a surprising improvement upon the star-fish, in that he has a whole set of teeth. Not only this, but he is, in one sense, ahead of you in the dental business, in that he has five jaws, while you have but two, and each jaw has its own tooth all to itself.

The next sub-kingdom includes the *Mollusks*, or soft-bodied animals like snails, oysters and clams, who live in shells and carry their houses wherever they go, always having their trunks packed and ready for a move. If you take a clam from his house before he is cooked, and look carefully at that edge of him which

was under the hinge, and at that end of him which is opposite his *siphon* (that is, the tube which is often called his neck, but it isn't his neck at all, because it isn't in the right place for a neck, and because he has n't any neck, either), you will find a hole with two pairs of feelers to it. That is his mouth, and the feelers are his lips. They are very long for lips, but they have to serve for lips and tongue, too. He has no teeth, and his mouth opens right into his stomach, in the handiest way possible. Taken as a whole, he is considerably more highly organized than the people already spoken of, even though the sea-urchin is ahead of him in dentistry. But there's a fellow in his kingdom who is considerably ahead of him, even, and that is the snail. If you have never made the acquaintance of the sea-snail, let me beg you to do so at your earliest convenience. You can easily find him in the mud at low tide. Put him in a pan of sea-water, and see him promenade! Look at the size of his foot, and when you have drawn his portrait alive, *en promenade*, drop him in alcohol, leave him there a few hours in his last sleep, and then hunt for his tongue. This is the greatest marvel in the

way of dentistry which has yet appeared. It is all covered with teeth. Only think how convenient! You will find clam and mussel shells on the shore, with little round holes in them which the snail has gnawed with this wonderful tongue of his. That's the way he gets his clams and mussels for his dinner.

The next sub-kingdom includes the articulated or jointed people, like lobsters, crabs, spiders and insects. They carry their skeletons on the outside, instead of inside, and move their jaws from side to side, instead of up and down. Their entire eating apparatus is very much more complex than that of any of the people previously spoken of, and they are considered "pretty well up in the world," as the saying is. The insects are very airy people after they get their wings. While they are in the larval stage they are very voracious, and keep their jaws going most of the time. These jaws are so hard and horny that they make quite a loud noise when they move, some of them; but after they evolve from the larval to the winged state they are much more dainty, and their side-moving jaws are replaced generally by a long, sucking tube,

which they plunge into the flower-cups for the nectar which they have scented from afar.

Last of all come the vertebrates, and that is where you and I come in. We all of us, from the fishes to you and me, except the turtle, have our skeletons out of sight, and we all move our jaws up and down instead of from side to side. More than this, we have a most elaborate set of tools with which to do our eating and digesting. See what an array of them is found in the mouths of all the higher vertebrates! Note the delicacy of the lips in the horse, for instance. The finest velvet cannot compare with them in softness, and so keen is their perceptive sense that not one offending substance is allowed to pass them. If our lips did such faithful service for us, we should be spared a large proportion of the ills from which we suffer.

Look now at your own teeth! What variety of form, and what nicety of adaptation, do you find! The front ones for cutters, the next ones for tearers, and the back ones for grinders! And then the tongue! "A little member," to be sure, "but it boasteth great things," and well it may, for we should have a hard

time without it. But the most elaborate apparatus in the mouth is the glandular, by which no less than four different kinds of saliva are supplied for moistening the food and fitting it for conveyance to the stomach. No less than two or three pounds a day of this fluid are prepared by a mouth which only chews the necessary quantity and quality of food, while the mouths that are forever chewing gum, or peanuts, or slippery-elm, or tobacco, or any superfluous substance, prepare very much more: for as the blood has to supply the materials for this excess, for which there is no provision in the original plan, it thereby becomes very much impoverished. By and by the results of this impoverishment begin to appear in the way of a thirst which calls for rum if it's a tobacco-chewing boy, and for tea if its a gum-chewing girl; and that's the way a good many forms of intemperance begin. The beautiful youth Charmides, with the fair soul in the fair body, was no chewer of tobacco; and Minerva, the beautiful goddess, was no tea-drinker, for no tea-drinker ever had the elegant repose and dignity which belong to her.

But the main point to which I would espe-

cially call your attention is the pains displayed for moistening the food without any help from without. If the Divine Architect of this temple in which we dwell has taken such infinite care, proceeding by these nice gradations from the polyp to the vertebrate, to supply our mouths with thirty-two teeth for chewing, and four kinds of saliva for wetting, the food we need, are we not committing a positive sin when we descend to the level of the alligator by tossing the food past the teeth as soon as they have grasped it, and sending it swimming in ice-water down to the stomach?

It is no less true of the work of digestion than it is of every other work, that the final success depends upon the thorough performance of the preliminary work, and you may be very sure of life-long immunity from dyspepsia if, having secured the right kind of food, you carefully follow Nature's plan for the preparatory work of the mouth; while you may be equally sure of becoming a confirmed dyspeptic, when you ought to be in your prime, if you neglect to use your teeth faithfully on your food, and, in addition to that, you wash it down with cold water.

We Americans have much to learn from our more mature neighbors across the sea in this matter of water drinking at table, and the sooner we banish the omnipresent pitcher of ice-water from its central point there to its appropriate place, the better for us all, for we work a deal of mischief by our intemperance in this matter: first, by diluting the gastric juice, and second, by reducing the temperature of the stomach.

Another way in which we invite the foe dyspepsia to abide with us is by restricting the free and easy motion of the stomach by our belts. The habit of wearing belts or bands of any kind about the body has too long held sway over us. No other animal could endure it without having its vitality sadly impaired, just as ours has been. And really there is no call for belts and bands now, even by that most capricious personage we call Fashion, for she has most amiably conformed to the growing demand for more common-sense in the matter of women's attire, and has given us the easy-fitting and graceful princesse and polonaise styles, which bring out the graceful contour of the body without cutting it in two by a

belt. The fickle creature really deserves a long credit-mark for thus coöperating with the hygienists in dispensing with all bands and belts upon any part of the body. It really seems as if she had been studying Physiology and Greek art for a change.

Let us, then, hear the conclusion of the whole matter. Chew your food long and well, drink no water with it, and wear no bands round the body, either over or under the dress; so shall you never know dyspepsia, provided you get proper food and are temperate at all times and in all ways. Do not keep eating a thing till you feel uncomfortable, simply because it tastes good, else you will be where the good old Quaker was of whom we read in Boswell's "Johnson." Here is a leaf from his diary:

"Tenth month, 17—An hypochondriac obnubilation from wind and indigestion.

"First month, 22—A little swinish at dinner.

"Fourth month, 29—Mechanically and sinfully dogged."

QUESTIONS AND ANSWERS.

A few of many questions which have been

proffered by different members of schools where I have given these lessons will be here and there introduced, in the hope that the answers may cover some of the many points which necessarily go unnoticed where the field is so wide.

"Shall we, then, drink no water?"

There's a time to drink as well as a time to eat, and since water constitutes three-fourths of the body, and since three or four pounds of this water daily pass out of it by way of the lungs, the skin and the kidneys, it is evident that an equivalent for this daily loss must be provided. Not only this, but the lining of the alimentary canal requires to be washed after it has done its work, just as the mouth and teeth do; hence it follows that a good time to take a full glass of water is two or three hours after eating. Two other good times are a half hour before breakfast and the retiring hour.

"And shall we drink nothing at table?"

Drink all the milk you can get. Milk is the most perfect form of food which we have provided for us. Many will say that they can't drink it, that it makes them bilious,

etc., etc. This idea has gained ground by the fact that many people eat just as much solid food with the milk as they would without it, forgetting that the milk is a very rich, nutritious food, and that it adds nearly as much to the labor of the digestive organs as does so much roasted turkey. We are all of us quite as apt to be injured by excessive quantities of food as by errors in quality.

"But shall we drink no tea or coffee?"

When you get to be fifty, if you require a staff to lean upon as you begin the descent, you can take a cup of properly-made coffee in the morning; but be sure you don't drink the boiled stuff which is left after the aroma has all passed off into the kitchen. Drink the best or none. The same with tea. You might as well tan your stomach with tan-bark as with boiled tea. I have had more cases of dyspepsia among servant-girls, caused by boiled-tea drinking than from any other single cause. During Lent they fast so rigidly — those of the Romish faith—that they drink great quantities of strong tea, by which the lining of their stomachs is converted into leather, and they are rendered, of all women, most miser-

able. They had much better live on milk during Lent. It would certainly be more economical than tea and sugar and milk and the inevitable doctor's bills.

"What is pepsine?"

Pepsine is the substance which every healthy stomach supplies for the digestion of the albuminous portions of the food, such as milk, meat, eggs, and the glutinous portions of grains. "Dyspepsia" implies an absence of pepsine, and when the human stomach is no longer able to prepare the article for itself, the chemist has to supply the defect by obtaining it from the stomach of the pig. Horrible to relate, but true! Pig may be admitted into Christian society if properly introduced, but his credentials are so questionable and his personal habits so filthy that it is quite as well to take the cleanly ox or sheep, as long as we can get them, and leave the dirty porker to wallow in his mire and keep his scrofulous tendencies in his own family.

Said the Rev. Adam Clark: "If I wished to offer a burnt-offering to the Devil, I would send him a pig stuffed with tobacco." And his favorite blessing at table was: "Lord,

bless this fruit and these vegetables; and if thou canst bless under the gospel what thou didst curse under the law, bless, we pray thee, this swine-flesh."

I don't believe that the beautiful youth Charmides, "the fair soul in the fair body," ever ate pig.

CHAPTER III.

WHAT SHALL WE EAT, AND HOW SHALL WE COOK IT?

You have learned from your studies in chemistry, or you will learn, that of all the sixty-three elements which constitute matter, so far as is at present known, only four take any large share in the composition of the body, namely: oxygen, hydrogen, nitrogen, and carbon. It is one of the most marvelous as well as beautiful evidences of the infinite skill of the Creator that he has combined and recombined these few materials in so many different proportions as to give us bone, and muscle, and skin, and nerve, and hair, and teeth, and all this nice variety of tissues which compel us to say we are "fearfully and won-

derfully made." To these four prominent elements a little sulphur, a little phosphorus, a little lime, a little chlorine, and a little sodium are added in the way of finishing off, somewhat as the builder of a house "made with hands" adds the hinges and the knobs and the paint and varnish to the already-constructed frame and superstructure. How these few simple elements are held together, and how the life comes and goes to and from them is the mystery which science has not yet unlocked, for now "we see through a glass, darkly." Probably Paul spoke thus of the obscured glass which the Greeks used to soften the brightness of their sky; but we, with our clear-glass lenses in microscope and telescope, still see but dimly through the curtain of mystery which hides God from us. Prof. Draper has lately found oxygen in the sun by means of the spectroscope, and Prof. Hall has found out by his telescope that "Mars has twins"; and so they have come so much nearer to God and to his secrets than we less able students; but neither the microscope nor the telescope nor the spectroscope has yet made it possible for man to combine oxygen, hydrogen, nitrogen and car-

bon so as to make a living plant, much less a living animal. But it is a great gain upon what the people of earlier times knew, to have proved that these four elements are used in the making; and as the years roll on and science strides on, we shall hope to learn more of the process, being always assured that the more we study his works the nearer we get to our Maker.

If we wish to know Beethoven, or Mendelssohn, or Raphael, or Phidias, we study their works; and the more we get into the spirit of these works, the nearer we come to a comprehension of the great artists themselves. How much more is this true of the great Artist of the Universe!

But do you ask what practical answer this knowledge brings us toward solving the question "What shall we eat, and how shall we cook it?"

Let us see! The chemists and the doctors, working together, have found out that starch and sugar and fat contain no nitrogen, but that meat, milk, eggs and the gluten of grains do contain it. Now, our muscles are just like what we call "lean meat" in our animal food,

and as they are constantly wearing out and the ashes being removed, we naturally ask, What is the kind of food which will supply this loss? We have the answer before us: Meat, milk, eggs and the gluten of whole grains. A diet of either or all of these foods will give us good muscles. That is a fact as fixed as the multiplication-table.

What, then, do we get from the sugars, starches and fats? Principally fat and heat. The Greenlander relishes his candles as a dessert, probably as thoroughly as you do your sweetmeats. It is the coal which he must have to keep up his fires. You relish your cakes and candies and peanuts because your bodies call for enough of them to give you a layer of wadding between your muscles and your skin, to fill out the wrinkles and to keep you warm; but when you find that this layer of wadding is getting so thick as to be intrusive, and to fetter the action of the muscles; when you get weary on slight exertion, and are tempted to squeeze yourself in tight clothes to hide your increasing corporosity—then you had better cut off your supplies of cakes and candies and peanuts. So much for muscle-and-

fat-making foods. For bones and nerves and pure blood you want liberal supplies of fruits and grains and vegetables. Oatmeal and cornmeal and wheatmeal and ryemeal, each and all, will help to keep your bones and nerves and brain in good order, provided you get the whole goodness of them. If your miller has taken off all the outside envelopes of the grain, and has left you nothing but the starch of its interior, then are your bones and teeth and nerves just so much defrauded, and the pigs' bones and teeth and nerves enriched.

We come now to the last, but by no means least important, part of our question, namely: "How shall we cook it?"

First and last and all the way between, don't fry it nor make it into pies! If you have no other way to cook food than to fry it, you had better take it raw. I do not make one exception, not even that dear delight of the New Englander, the ubiquitous doughnut. I believe this popular food has been the cause of a great deal more dyspepsia than is generally suspected. I always observe a great deal of eructation of badly-smelling gases by habitual doughnut eaters, and also by fried-potato

eaters. You cannot put any food into a more difficult form for digestion than by enveloping it in a coat of hot fat. You might almost as well wrap it in sole-leather.

Now for the pies. I never see an apple-pie without thinking of the sad waste of time and labor and substance of which it is the outcome. To put that king of fruits, the apple, all shaven and shorn of its gorgeous covering and the wealth of flavor and fragrance and bone food which go with it, into a foul, pasty mass of hogs' lard and starch, is for me the literal rendering of the wise man's "jewel in a swine's snout."

Hear Joel Benton talk about the apple! "As iron is rated among the metals, so the apple ranks among fruits.... As the word *book* is appropriated as the fit name for the chief book of all, so *apple* sometimes stands for fruit in general. Scripture and geology, which have been supposed to differ about some things, agree as to its age, both placing its birth just a little before man's, as if it were said, 'Now the apple is born, it is time for man to be, who is destined to eat it.' It is not Genesis, but tradition, which makes it the apple that

was put into Eve's hand, and afterward into her own and Adam's mouth; but literature seems quite at unison in accepting this version of the matter. The unfortunate fruit, whatever it may have been, was said to be of the tree of knowledge; and, curiously enough, the apple has a very pertinent relation to the brain, stimulating its life and its activity, which it does by its immense endowment of phosphorus, in which element it is richer than anything else in the vegetable kingdom. But phosphorus is not only brain-supporting: it is *light-bringing;* and must thus contribute to knowledge....The epicure of this fruit tells you they should always be eaten raw; and the second orthodox rule is, to 'dispense with the knife.' Any one, however, who is not anxious to have them as good as they can be, will do the next best thing in following this recipe, which I will venture to vouch for: Buy a small tin apple-corer; core with it as many apples as you want, *without peeling them;* set them on a tin dish; place this in a hot oven, having first filled up the vacancies left by your surgery with the best of sugar. Let them bake till they are well done. Take them out,

and if you do not know what to do next, call in your nearest and best friend for further advice."

All the cook-books that ever were made, or ever will be, cannot give a better recipe than that for cooking apples. I always feel that I've been swindled when compelled to accept apple-sauce as a substitute for the above form—that is, apple-sauce according to the approved pattern, where all the peelings, and the rich flavor and nutriment which go with them, have gone to make the pigs glad, and left me to grieve over that mistaken notion of the fitness of things which is forever sacrificing the substance for the show. "But they don't look nice!" is the only protest which the misguided matron offers, and that is quite apt to be a sufficient reason for her to continue to do just as she always has done. So she peels her apples and rolls them up in lard paste, and tells you she never gets time to go out-doors for any fresh air, when, if she would only look at the matter without the spectacles of custom, she could put her apples in the oven and leave them to take care of themselves while she refreshed herself with a brisk half hour or so

away from her cook-stove and her flour-barrel.

It's just so with potatoes, alas! What a deal of time is wasted in peeling them, to say nothing of the valuable nutriment which goes with that part of them which is right under the outer skin! By all means, bake your potoes with their jackets on, or, if the exigencies of the occasion compel you to boil them, then boil them with their jackets on, else a large part of their best qualities is dissolved and thrown away in the water of boiling.

The best way to cook beef is to broil it or roast it. In both cases it should be subjected at once to a heat intense enough to form a protective crust which shall retain the juices at its center. Corned beef contains very little of the original nutriment, this having dissolved out in the brine, so that we get not much but chips. They may have an agreeable taste, due to the brine, but it is best to partake sparingly of anything which simply pleases the palate, but which offers no compensation to the digestive organs for the labor they must bestow upon it.

If meat is to be boiled, it should be put at

once into boiling water, for the same reason that it should be put in a hot oven to roast: so as to assist it to retain as much as possible of its own juices. If soup is the objective end, then put the meat in cold water and let it gently simmer for several hours. Thus may you get its substance in the water of cooking, but it is poor policy to eat the fibrous remains of soup-meat. The virtue has gone from them. Put them away from you. Don't attempt to economize by making them into mince-pies, else it will cost you more to pay your doctor's bills than a whole ox, properly cooked, would cost. The only thing which is fit to eat in a mince-pie is the apple, and that is only half an apple, deprived of its skin. I have seen a heart-rending sight during the past summer in the way of mince-pies. It was a poor woman bending over the chopping-bowl and rolling-pin and cook-stove, in the heat of midsummer, for the sake of saving (!) some meat by putting it with dried apples for mince-pies. And this in the height of the berry season, and the poor soul thought she couldn't afford to buy berries, so she took money enough to buy several quarts of berries, and threw it

away on the sugar and spice and greased paste which went to make those horrible pies. Verily, her children called for berries and she gave them stones.

For bread, find where they keep flour which retains all the goodness of the grain, and buy no other; then let the bread be twenty-four hours old before you eat it. It is not chemically done till then. Hot bread is so difficult of mastication that it is quite apt to pass into the stomach in the form of a bullet, and is nearly as indigestible as that article. The perfection of bread is found in "Graham gems." When properly made, nothing could be nicer. When not properly made, nothing could be poorer. A light, well-beaten batter of the best Graham flour, wet with equal parts of milk and water, and dropped upon hot iron pans and baked in a quick oven, makes the model "Graham gems." The longer you chew them the sweeter they grow and the stronger you grow.

I have seen girls, when out on a tramp, stop at a village store and buy doughnuts with which to refresh themselves! The doughnuts made them thirsty, and then down went the ice-water.

Next day they came to school with the complaint that they had had a headache the night before and couldn't study, and so must be excused. No wonder they had headache! The brain protests against the poor blood which is conveyed to it after such a repast as that. There were plenty of nice, ripe pears at the same store, to be had for less money than the miserable greasy doughnuts cost. The pears would have left their brains clear and free from aches or clouds. I think they will buy the pears next time. And so it is through life:

> "We slight the gifts that every season bears,
> And let them fall unheeded from our grasp."

Said Milton:

> "Not to know of things
> Remote from daily use, obscure and subtle,
> But to know of that which all about us lies in daily life,
> Is the true wisdom."

Let us seek the true wisdom, so may we become as fair and as strong as Minerva!

CHAPTER IV.

THE HEART.

The heart, "that little three-cornered exponent of our hopes and fears.... What authority we have in history or mythology for placing the headquarters of god Cupid in this anatomical seat, rather than in any other, is not very clear, but we have it, and it will serve as well as any other. Else we might easily imagine, upon some other system which might have prevailed, for anything our pathology knows to the contrary, a lover addressing his mistress, in perfect simplicity of feeling, 'Madam, my liver and my fortune are entirely at your disposal.'"—Charles Lamb.

The sacred Scripture says the heart is "deceitful and desperately wicked." The anato-

mist calls it "a hollow muscle." The physiologist calls it "a pump." And they are all right. It is all these things, and more: for, psychologically, it is too deep for the human eye to comprehend, and, anatomically, it is the one essential muscle upon which the body's life depends; while, physiologically, the integrity of the valves by which it is so aptly called "a pump" is the feather which may turn the scales for life or death.

You have learned from your studies in zoölogy, or, if you have not, you will learn, by what marvelous gradations from the lower to the higher forms of life this most perfect mechanism has been achieved.

Beginning with the radiates, you will find a simple tube in the rays of the star-fish, which is at once a water-pipe to supply the impetus for motion, by conveying numberless little streams into its tubular feet, and which at the same time acts as a pulsatory heart—a very simple heart, to be sure, but one which serves its purpose just as well as yours serves you. The sea-urchin gets a step or two higher and gets a ring-shaped heart around his æsophagus, or swallow-tube; while his mastership

the clam, one of the princes among mollusks, actually comes to the dignity of a two-chambered heart, with a real auricle and a ventricle. He is even more gifted in the way of a heart than any of his more active friends in the sub-kingdom of articulates—the crabs, the lobsters, the moths, and the butterflies, and all those fine people with their gay feathers; for they have only a straight tube running along their backs. If you get a live clam and invite him to make himself comfortable in a pan of fresh sea-water, and then gently remove his left valve, you can see his heart beat, if you look in the right place. As old Roger Bacon told the people away back in the thirteenth century, when they asked him how he made his gunpowder, "Take of saltpeter, with pounded carbon and sulphur, and you will then make thunder and lightning, if you know how to prepare them." So if you know how to look for the heart of a clam, you will find it, and you can also count his pulse beats, as he is one of the cool and collected kind of people who never get up a palpitation of the heart on any slight provocation.

The fishes also boast of a two-chambered

heart, and his frogship and his snakeship get so far up in the ranks as to have three rooms in their hearts. This, you will easily see, if you study into the matter, results in a mixed quality of blood, so that no one of these people can boast of any real "true blue blood," although they are of the race of vertebrates, each having a real backbone all to himself. The upper-crust people who live on the top rounds of the ladder are obliged to count them in, but they by no means put them on an equality with the rest of the backbones, who have four rooms to their hearts.

If you have never seen the inside of the perfect mammalian heart, let me ask you to go and get one from your market-man as soon as possible. That of a pig, a sheep, a calf, or an ox will serve you. Then take your physiology book and find out its beauties. You will see just how your own heart looks, and you will never wonder that the poets have said so much about it in a figurative way.

Let us now turn to the consideration of what this little four-chambered "three-cornered exponent of our hopes and fears" does for us. Into its right upper chamber, or "auricle," as

it is called, from its resemblance in shape to a little ear, as the word signifies, comes the liquid which has been prepared from the food by the organs of digestion. The stomach, the liver, the pancreas, and the intestinal glands have all been at work to transform the bread and milk, and the candies and the peanuts, and, alas! the doughnuts, too, into a fit form for their reappearance as bone and muscle and brain and nerve and all those complicated fabrics of which each of our bodies is made. But before this liquid result of so much work can appear in such high company it must report at the central office, the heart. Entering its "Vorhof," as the Germans call it, or vestibule, it is passed on through the most beautiful system of gates, called the tri-cuspid, or three-pointed valves, to the right lower chamber, or "ventricle"; thence to the lungs, where it receives the finishing touches in the way of exchanging its carbonic acid, or its old clothes, for the life-giving oxygen which there awaits its coming, in lungs which are left to work as their Maker intended they should. Returning thence, brightened and vivified, it enters the left vestibule or auricle, is pumped past a beautiful

two-pointed valve from there to the left ventricle, whence it issues through some most delicate half-moon-shaped valves into a large tube called the "aorta," which there begins to send off branches to all parts of the body and its extremities, so that every tissue may receive a supply of nourishment. On it sweeps, this life-current, with its bone-food, its nerve-food, and its muscle-food, so swiftly that it gets back to the heart, through the capillaries and veins, in twenty-five or thirty seconds from the time it leaves it, bringing a supply of worn-out material which it has taken in on its round, in exchange for the new goods it carried out. "Like the water flowing through the Croton pipes, that carries health and wealth to the portals of every house, and filth and disease from every doorway, the blood, flowing through the canals of the organization, carries nutriment to all the tissues and refuse from them. Its current sweeps nourishment in and waste out."

It is comparatively an easy thing to describe the circulation of the blood after it has been shown us, but it took centuries of hard study to find it out, and it is only three centuries since Dr. William Harvey, of England, who gave

to the world the true statement of it, was born. For full three centuries before Christ and for sixteen centuries after him the wise men had been asking nature to reveal this wonderful secret to them. Each of them came a little nearer to the truth than his predecessor, but the glory of the final discovery belongs to Harvey.

I wish, my dear girls, that I might help you to comprehend, in some slight measure, the perfectness of God's plan, as thus described, for keeping your whole bodies supplied with pure blood, so that your cheeks shall always wear the rose-tint of health, and your eyes always sparkle with the light which shines out only from brains which are fed with such blood. "Polished steel is not quicker dimmed by the breath than is the brain affected by some abnormal condition of the blood."

Every headache is a protest which the brain puts forth, either against the unclean blood which is sent to it, or against an excess of either arterial or venous blood. If you have eaten three or four hot biscuits for supper and poured down one or two glasses of cold water, you have taken one way to get a headache,

and a bad breath which will report you to your neighbors next morning. If you have added to this one or two pieces of rich cake, or a piece of mince-pie, you may be pretty sure of an aching head with troubled dreams. The brain is fastidious in its choice of blood, and will not accept the stuff which comes from half-digested fried food, hot biscuits and pies, without protesting. Eat only bread which is twenty-four hours old, chew it well and moisten it only with your own saliva—given you for that very purpose; omit the pies, fried things and rich cakes, and your head will never ache because of dirty blood: certainly not if you eat plenty of apples, either baked or raw, with their skins on. Chew the skins well until you have extracted all their virtue, and then reject such portions as may be too tough to be finely chewed. When you cannot get apples, get the best substitute you can find. All kinds of fresh fruit, such as the market supplies at all seasons—whether oranges, bananas, grapes, peaches, tomatoes, berries or melons—are infinitely better blood purifiers than all the nostrums ever concocted for the ostensible purpose of effecting this object; and when you cannot

get the fresh fruits, get either the dried or the canned ones. Every dollar you spend for fruits is so much saved in the way of doctors' bills, and every pie you eat is as good as a prescription for the dose of pills which will be pretty sure to follow it. As for pig-meat, however served — whether as *Extract casiene caput* (head-cheese), *Pulv. Sausagiae* (sausage-powder), or *Infus. Baconii* (bacon infusion)—whoever eats it is pretty sure to pay heavily for it, unless she spends the next six or eight hours outdoors in active exercise, so as to get oxygen enough to burn up the stuff. One may be pardoned for eating pig-meat when nothing else can be had, but, as long as the markets abound in so many better things, pray let us leave the pig in his own mire and not soil our brains with his foulness.

But the head may ache, and often does, if it has too much blood, even if it be of normal quality. In fact, a large proportion of our aches mean that the blood is in the wrong place, and all the doctor can do is to "derive" it from the aching spot to one remote from it by the various ways with which all are familiar. But what makes it get into the wrong place?

Many things make it. If you wear too little clothing on the feet and lower extremities in cold, wet weather, the blood will not go into them to warm them, but will take the easiest route, to the head, which will then cry out, in its agony, "My veins are full to bursting, and I ache terribly." The same result will follow if the shoes be tight or the hose are kept in place by bands about the extremities. Any band, elastic or otherwise, which is tight enough to keep the hose smooth is tight enough to interfere with the circulation of the blood. Don't wear it! There is a way of adjusting hose, which you can learn at any dress-reform store, whereby they are kept perfectly smooth, and not a single blood-vessel in the whole body is compressed. It dispenses with all bands, and is thoroughly comfortable and convenient. Get it, wear it, and tell all your mates to get it!

The head may ache, too, because the muscles are not exercised enough, and because it is oppressed with the blood which ought to be freely circulating through them. Some of you bend over your books too long at a time, and some of you sit at the piano too long, and some

of you sit at the sewing-machine too long, and your muscles get pale and flabby and your head gets hot and heavy; and, too often, instead of taking the warning and rushing out for a good, brisk walk in the open air, you make a bad matter worse by shutting yourselves in your close rooms and sipping tea. That is the poorest possible substitute for fresh air and exercise. You will get no bloom on your cheeks and no light in your eyes by drinking tea, but you will grow yellow and withered, like the "sere and yellow leaf," which has lost its sources of nutriment. When you see a young woman whose skin looks like old flannel, showing traces of the starch-box or the rouge-pot, it is pretty safe to infer that she gets very little exercise in the open air and that she is a confirmed tea-toper. Let the tea stay in China till you come to your fifties or sixties, and you may be sure of being as handsome as old ladies as you will be as young ones.

"What causes varicose veins?"

Varicose veins are swellings in the veins caused by interruptions to the circulation of the venous blood. You will understand, from

what has been told you, that the blood has to flow upward in the veins of the trunk and lower extremities in order to return to the heart, and a little thought will show you how easily you can interfere with this current by wearing bands about the body or lower extremities. These all-too-prevalent bands are a common cause of varicose veins. Habitual standing is another cause.

"What causes palpitation of the heart?"

In the majority of cases, indigestion is the cause. The heart is located directly above the stomach, with only the diaphragm between them. The diaphragm is the muscular floor of the chest. If the stomach becomes distended with the gases of indigestion, it crowds the diaphragm up against the heart. The heart then utters its protest against the intrusion by a more rapid beating, for it has no room to spare in a chest which is held still by bones and bands and steels, no matter how loose they may be. There can be no natural or free motion for ribs and muscles which are always worn in splints, and where the ribs and their muscles are thus fettered the heart is sorely perplexed by any additional crowding

from below, such as it is subjected to when digestion is arrested.

"What is the cause of cold feet?"

Anything which prevents the blood from circulating freely in the feet will tend to keep them cold. In addition to the bands already mentioned, whether elastic or otherwise, insufficient exercise in the open air is a common cause of cold feet, and the best of all ways for warming them is to take a brisk walk on the sunny side, having first prepared them by putting on warm hose and thick, broad-soled and low-heeled shoes. You can no more walk properly in thin, narrow-soled, high-heeled shoes than you can on stilts; nor can you get the full benefit of a walk if you keep your arms rolled in a shawl or folded in a muff. The hands should be so protected that the arms may fall naturally by the side when walking. There can be no really graceful walking with folded arms.

"How may cold, sweaty feet be cured?"

By clothing them so that the blood may circulate freely in them, and by keeping them familiar with clean water and fresh towels. A

good plan is to plunge them rapidly, first into hot and then into cold water, two or three times on retiring, and then rub them very dry with coarse towels.

CHAPTER V.

HOW WE BREATHE.

"And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul."—*Genesis* ii, 7.

In our lessons upon the skeleton we have learned how carefully the framework of the human nose is prepared for the important part it is destined to take in the function of respiration. We have seen how delicately the bones about the nostrils are turned and coiled so as to increase the surface over which the air must pass on its way to the lungs, and that the result of this extension of surface is the warming of the cold air to the proper temperature for its reception into their more delicate cells.

If you look now at the entrance to your nostrils, you will see how carefully it is guarded by little hairs, whose office it is to sift the air and thus render it still more fit for its becoming "the breath of life." The lesson taught us by Moses in the above quotation from his history of the Creation, so sublime in its simplicity, is emphasized by the anatomical study of the nostrils, and one is more and more deeply impressed with the profound insight of the "Man of God" into the designs of the Creator whose works he so faithfully studied. Many a writer of books upon anatomy and physiology has since enforced the truth that the nose is the preparatory organ of respiration; that the perfection of every function depends upon the thoroughness with which its initiatory work is done, and that all the higher orders of animal life breathe their air, while frogs and turtles and their kin swallow it; but no one of them all has said as much on pages as Moses said in this one brief sentence. Let us heed the lesson! Let us apply it to every act of our lives, and so, by making our beginnings aright, shall we en-

sure that success which crowns all work which is well begun!

Have you ever noted the imperfect breathing of people who, either from habit or from deformity, swallow their air, instead of taking it by the nostrils? And have you observed the noise they make about it? Audible breathing is not in accordance with the divine plan. All of nature's finest processes, like the growth of tissues, the circulation of sap and blood, and the entrance of the air into the lungs, are noiseless. Let the air enter as God meant to have it, and it will enter with no sound for the most sensitive ear at the ordinary distance between individuals; but let it enter through a mouth which is habitually open, and the sound becomes offensively apparent. "The worst wheel squeaks the loudest." Such breathers are an annoyance to their companions by day and a positive nuisance by night. There would be no snoring to echo through dormitories if all breathed as God meant they should, and one of the ways to prevent it is to hold the lips together by an apparatus recently invented by Dr. Wyeth for the purpose, for those who have

been allowed to develop the habit by the inattention of their nurses in childhood.

You will notice another characteristic of this class of breathers. They always seem to have a cold, as evinced by imperfect articulation and the other accompaniments of a "cold in the head." They generally have large tonsils, too, and in this condition it is difficult to discriminate between cause and effect, for the large tonsils may have induced the habit of breathing with the mouth open, and, on the other hand, the mouth-breathing may have caused the enlargement of the tonsils; but, whichever may be the cause, the indications for treatment are identical, and point to the reduction of the size of the tonsils.

This brings us to the consideration of the second part of our breathing apparatus, namely, the throat, at whose entrance stand the tonsils, but whose office is not yet accurately understood. Indeed, Dr. Robinson, writing upon the subject, goes so far as to say, "Were I to make a man, I do not think I would put tonsils in him." But as we all have them, it is safe to conclude that they are essential, rather than superfluous, organs. It is no less safe to

conclude that if we learn and obey the laws by which the rest of the body is kept in healthy action, we shall not find them to be a source of annoyance and discomfort.

Let us look, for a moment, at some of the other results incident to their enlargement, additional to the one already mentioned. From the throat there is a tube, on each side, which communicates with each ear. The closure of these tubes by the enlarged tonsils may lead to deafness, and often does. These three serious results, namely, faulty respiration, muffled and imperfect vocalization, and deafness, are all common conditions among mouth-breathers. But a still more serious complication comes in as a result of large tonsils in growing children, in that the growth and development of the chest and lungs may be arrested in consequence of the interruption to complete filling of the lungs which large tonsils necessarily offer. This may be a cause of consumption in after life, for this destroyer finds its surest victims among those who have small, poorly-developed lungs. Thus you see what agents for evil these little bodies become if allowed to grow too large.

The question at once arises, How shall this enlargement be prevented? Nothing could be simpler or more natural than the indication which at once suggests itself to the thoughtful, namely, to guard against excessive flow of blood to the parts in question — the same point, you will remember, which was made prominent in our lessons upon circulation. Keep the blood in the right place, and all goes well, provided its quality is good. Granted an excess of it at any one point, and there is an inevitable protest at that point against the intrusion.

If, for want of proper protection, the surface and extremities of the body are habitually chilled, especially in childhood and youth, during the whole growing period of twenty-five years, it is more than probable that the above conditions will result. We are all of us, young women and middle-aged women, and children, too, inclined to muffle the throat too warmly, thereby inviting the blood to concentrate at that point, when it ought to be in the hands and feet, keeping them warm. Furs about the neck are in the wrong place. They should be on the feet and hands; and the yards of

woolen mufflers which one sees wound about the necks of children should be on their legs rather than there.

But the best of all ways to insure one's self from sore throat and swollen tonsils is to keep the entire skin active and ruddy by making it as familiar with cold water as the hands and face are wont to be. Said Miss Jane Porter, the novelist, to her brother, who was a physician: "I am always catching cold everywhere but in my face. I wish my body was all face." "Make it so," was his reply. It is easy to form the habit if one begins in early life; and, when it is formed, the daily morning ablution in fresh, cold water becomes the one luxury which, of all others, we would least willingly forego; while the perfect exemption from colds and sore throats which it secures is a state of things which makes life a constant joy. Can you think of any greater joy than to be always well and strong? To be able to say, I can go and come in all weathers and at all times, because I never take cold!

We pass now from the tonsils to the larynx, or organ of vocalization. This is one of the most delicately formed organs in the body.

Through it comes and goes every "breath of life," and upon its vocal cords hang the sweetest harmonies of life. If the air is breathed through the nostrils, and by them warmed and sifted; if the throat and tonsils are not surcharged with blood which ought to be in the feet and cannot get there because of the bands and tight shoes in the way; if, in short, Nature can carry the air through the larynx in her own good way, there will be no discord there. The mythical "music of the spheres" can be no more harmonious than the melody of a perfectly correct human voice. Says George MacDonald: "A sweet tone is a messenger of God; and a right harmony and sequence of such is a little gospel."

There has never been a time when the human voice has not been an instrument of power, a charm, a delight. When we pass beyond history to the regions of fable, we find that, among the gods of the ancient Greeks, those were held in the highest honor whose voices had a sound potent for good or evil. Jove, the imperial monarch of Olympus, had but to direct the lightning and command the thunder.

Homer writes:

"He speaks, and awful bends his sable brow,
Shakes his ambrosial curls and gives the nod,
The stamp of fate and sanction of a god.
High Heaven, with trembling, the dread signal takes,
And all Olympus to the center shakes."

Of the nine muses, six reached gods and mortals through the voice; and to Calliope, the muse of eloquence and poetry, was given the precedence.

If we put faith in the grand opening of biblical history, it was the voice of the serpent that beguiled Eve; and it was the soft voice of the first mother that, falling upon the ear and heart of Adam, betrayed him to his undoing; and, whether we accept the narrative literally or as an allegory, a hush falls upon the spirit as we read of the voice of the Lord God in the garden, calling upon the man and saying, "Where art thou?"

Jubal was the father of those who played upon the harp, and there is little doubt that the first musical instruments, as are all later ones, were but feeble attempts to imitate the notes given forth by the human larynx, or to accompany the songs of joy and praise of the people.

Miriam sang, after the passage of the Red Sea, those magnificent words which form most thrilling passages in our sacred music and oratorio, "Sing ye to the Lord, for he hath triumphed gloriously!" and Hebrew history, full of war and bloodshed, of idol worship and sin, as it is, is more than redeemed by Hebrew poetry. Nay, if we go from Earth to the Beyond, we find the poets and seers, whose fancies paint its attractions for mortals, as in the vision of John, telling us of ten thousand times ten thousand surrounding the throne, with voices and harps attuned to the majestic melodies of the skies.

But if we fail to conceive, with our limited faculties, of celestial sounds, and listen only to mortal tones, we shall have the fullness and the glory of the human voice revealed to us even more forcibly than by any flight of the imagination. We know its compass, we acknowledge its power, we listen with rapture to its melodious utterances, we feel in our thrilled hearts its touching tenderness.

The capacity of the human voice is beyond that of all the musical instruments ever invented. In its tones we can read the mind

of the speaker, without seeing his face. Hope, fear, anger, revenge, love, hatred, despair, are told with unerring directness.

The voice of Parepa brought adoring thousands to her feet. Woman, through her words of love and tenderness, has exercised a greater power over the race than have all the monarchs, backed by all the armies, of the world.

In sickness, her tones of tender sympathy are often more efficacious than medicine; and the strong man, brought low by suffering, and the restless infant are alike soothed to slumber by a woman's low voice.

There is no characteristic in a mother, a teacher or a nurse which is more readily caught up and echoed than the habitual tone of her voice. A screaming, scolding, harsh-voiced mother or teacher will be very sure to find her own tones reflected to her by the little ones who are so unfortunate as to hear them.

Thackeray says: "The world is a looking-glass, and gives to each individual the reflection of the face he brings to it. Smile on it, and it will smile in return. Frown on it, and it will frown in return." Children are no less accurate mirrors, which reflect, in tone, manner

and action of all kinds, the habits of those whom they oftenest encounter.

The most delightful school I ever saw was a primary school, of nearly a hundred children, presided over by one woman, whose voice was the very essence of gentleness. During a series of visits there I never heard her raise her voice above the ordinary tones of conversation; but those tones were exquisitely modulated, and so clear and pure that they reached the most distant ears in all their purity. The children's voices were like hers. They never screamed at her, for she never screamed at them. They never spoke in fretful or peevish tones to her, for she never spoke in any but cheerful tones to them. Do you ask the secret of her power over them, by which she kept them from restlessness and noisiness? She loved them, and her voice showed that she loved them. Added to this tender child-love there was a self-control which, above all else, is essential to the control of others. She kept her whole body subject to the dictates of her reason. She knew that she could do little in her chosen profession,

"To teach the immortal mind, no mean employ;"

unless she kept her body in health; and she knew that her voice depended upon large lungs for its power, its sweetness and its endurance. So she gave her lungs the largest liberty, in ways which you shall hear.

CHAPTER VI.

HOW WE BREATHE.—*Continued.*

From the nostrils to the larynx, and from the larynx through the trachea and bronchi to the lungs, is not far, but "'tis enough" for all that Nature would do for us there if she can have her own way. And how rare is the workmanship there displayed! We saw, in our lesson upon the circulation of the blood, by what gradations in the animal scale she came to that perfection of function which results from a four-chambered heart, and it remains for us to trace out a no less striking gradation up to the human lung.

All animals are classed as air-breathers or water-breathers, and all breathe either by means of tubes, gills or lungs. Respiration in ani-

mals, whatever be its mode of execution, has always the same object, namely: the exchange of carbonic acid, or waste product of tissue wear, for oxygen. The earth, the air and the water are each and all so rich in this life-giving element that each and all can get the requisite amount from their native element, whatever that element be.

The sponges and coral polyps, and all those very humble little people who are so small that it takes a microscope to find them, do not have any special apparatus set apart for the purpose of respiration, but they breathe at one part of the body just as well as at another. Certainly a very convenient arrangement, which we might be led to covet under some circumstances.

The star-fishes, sea-urchins and their relatives have a curious "water-pipe system," by means of which their air and their blood and their water are carried round to them all at once. This plan has also its obvious advantages; but when we rise to the estate of the clam and the oyster, who live in "marble halls" with folding-doors, we find a great advance in the style of their breathing, in that

they have very elegantly constructed gills, most finely fringed, by means of which their blood comes to be of quite a select quality compared with that of the people below them, although it is neither blue blood nor yet red, but simply white. The fishes, however, have the perfection of water-breathing apparatus, and you have only to lift the gill-covers of the next one you see to find how delicate and beautiful it is. You will find four or more strong arches supporting little fringes whose component parts consist of minute loops of arteries and veins, which meet here to exchange the carbonic acid which has been picked up by the veins all over the body for the oxygen which the water brings to the waiting arteries. Those arches are the gill arches, and the fringes on them are the gills, and the gills are for the fish exactly what your lungs are for you: the *sine qua non* of his existence. Keep his gills wet, and life goes on smoothly for him. Let them get dry, and the way is rough. So, if you can get air for your lungs, life is a joy; but close up this sole avenue for your "breath of life," and your sun must go down in darkness. Not so with the insect world. They have air tubes

all over the body. Catch a grasshopper and look on the sides of his abdomen, and you will see little openings, like a row of button-holes, through which the air enters and animates his body. Then take your microscope and find the coils of air-tubing all wound up in him, and you will understand why he is so very much alive: because he gets so much fresh air. No wonder he sings all the time! Anybody feels like it when the body is full of pure oxygen. Do you know the story of the grasshoppers, as told by Plato in the dialogue called "Phædrus"? Listen to it:

Socrates is represented as having gone out to walk, at mid-day, with his friend. Seated under a plane-tree, he says: "A lover of music like yourself ought surely to have heard the story of the grasshoppers, who are said to have been human beings in an age before the muses. And when the muses came, and song appeared, they were ravished with delight, and, singing always, never thought of eating and drinking, until at last they forgot, and died. And now they live again in the grasshoppers; and this is the return which the muses make to them: they hunger no more,

neither thirst any more, but are always singing, from the moment they are born, and never eating or drinking; and when they die, they go and inform the muses who honor them on earth. They win the love of Terpsichore for the dancers by their report of them; of Erato for the lovers; and of the other muses for those who do them honor, according to the several ways of honoring them; of Calliope, the eldest muse, and of her who is next to her, for the votaries of philosophy, for these are the muses who are chiefly concerned with heaven and the ideas, divine as well as human, and they have the sweetest utterance."

All insects have these breathing-tubes distributed all through their bodies. They are called tracheæ, and correspond in function to the lungs of the higher vertebrates.

The simplest form of the lung of the vertebrates may be seen in the frog. I wish every one of you would give herself the pleasure of seeing this wonder of creation at her first opportunity. A toad will do just as well as a frog. You have only to put him in a bottle with a handkerchief saturated with sulphuric ether, and, as soon as he is sound asleep, open

the skin of his abdomen with a sharp knife or scissors. You will see the pretty lungs all inflated, and the little heart beating between them. Then cut out the little heart before he wakes, and he never will know that he has been cut, and you will have seen just how one of the air-cells of your lungs looks. Now you have only to imagine cluster after cluster of these delicate little sacs, all opening into the bronchial tubes, by the thousand, and you will have a very good picture of your own lungs. I hope you will also realize what an awfully wicked thing it is to squeeze the lungs. Believe me, my dear girls, you can do your bodies no greater favor than to let your chests remain in just the shape your Maker left them. He knows very much better how to shape them than you or your dressmaker know. He has put no less than thirty-nine bones into the walls of your chests, and you need no more. There is a set of muscles between each pair of your ribs, and a diaphragm at the bottom of the chest, and He who put them there meant that they should be always in motion, from the time you draw your first breath till you die, and whenever you surround the chest

with bands or bones you do just what the surgeon does for a broken bone: you put these muscles all in splints and hold them still, and from that moment you are only half as much alive as you ought to be.

It matters not if you answer that your bands and your bones are loose. Your brothers do not have bands and artificial bones to hold them in shape, and you have just as many bones as they have. It matters not if you tell me that you cannot hold yourself up without corsets. You can do what you should do, and you should hold up your own bodies by the means which God has given you for that purpose.

Hear what Canon Kingsley said to you in one of his best books, entitled "Health and Education":

"I suppose you will all allow that the Greeks were, so far as we know, the most beautiful race that the world ever saw. These people had made physical as well as intellectual education a science, as well as a study. Their women practiced graceful, and, in some cases, even athletic, exercises. They developed, by a free and healthy life, those figures

which remain everlasting and unapproachable models of human beauty. But — they wore no stays. The first mention of stays that I have found is in the letters of Synesius, Bishop of Cyrene, on the Greek coast of Africa, about four hundred years after the Christian era.

"He tells us how, when he was shipwrecked on a remote part of the coast, and he and the rest of the passengers were starving on cockles and limpets, there was among them a slave-girl out of the far East, who had a pinched wasp-waist, such as you see on the old Hindu sculptures, and such as you see on any street in a British town.

"And when the Greek ladies found her out, they sent for her from house to house, to see this new and prodigious waist, with which it seemed to them impossible for a human being to breathe or live; and they petted the poor girl, and fed her as they might a dwarf, till she got quite fat and comfortable, while her owners had not enough to eat. So strange and ridiculous seemed our present fashion to the descendants of those who, centuries before, had imagined, because they had seen

living and moving, those glorious statues which we pretend to admire, but refuse to imitate.

"It seems to me that a few centuries hence, when mankind has learned to fear God more, and therefore to obey more strictly the laws of nature and of science, which are the will of God—it seems to me that in those days the present fashion of corset-wearing will be looked back upon as a contemptible and barbarous superstition, denoting a very low level of civilization in the people who practiced it.

"That for generations past women should have been in the habit—not to please men, who do not care about the matter as a point of beauty, but simply to vie with each other in obedience to a something called Fashion—that they should, I say, have been in the habit of deliberately crushing that part of the body which should be specially left free, contracting and displacing their lungs, their heart and all the most vital and important organs, and entailing thereby disease not only on themselves, but on their children after them; that for fifty years past physicians should have been telling them of the folly of what they have been doing; and that they should, as yet, in

the great majority of cases, not only turn a deaf ear to all warnings, but actually deny the offense, of which one glance of the physician or of the sculptor, who knows what shape the human body ought to be, brings them in guilty: this, I say, is an instance of—what shall I call it? which deserves the lash, not merely of the satirist, but of any theologian who really believes that God made the physical universe.

"If one chooses a horse or a dog, whether for strength or for speed or for any useful purpose, the first thing to be looked at is the girth round the ribs: the room for heart and lungs. Exactly in proportion to that will be the animal's general healthfulness, power of endurance, and value in many ways.

"If you will look at eminent orators who have attained a healthy old age, you will see that in every case they are men of large size both in the lower and in the upper part of the chest; men who had, therefore, a peculiar power of using the diaphragm to fill and clear the lungs, and therefore oxygenate the blood of the whole body. Now, it is just these lower ribs, across which the diaphragm is stretched

like the head of a drum, which stays contract to a minimum.

"If you advised the owners of horses and hounds to put them into stays in order to increase their beauty, you would receive a very decided refusal. And if you advised an orator to put himself into stays, he would reply that to comply with the request would involve the giving up of public work, under the probable penalty of being dead within the twelvemonth.

"And how much work of every kind, intellectual as well as physical, is spoiled or hindered; how many deaths occur from consumption, and other complaints, which are the result of stays—is known partly to the medical men, who lift up their voices in vain, and fully known to Him who will not interfere with the least of his own physical laws to save human beings from the consequences of their own willful folly."

The good man who said all these good things to us has gone where corsets and other wicked things "cease from troubling," but I am sure his blessing rests on the "dress-reform" of which I am going to tell you farther on, and which enables you to look your very pret-

tiest, while it, at the same time, leaves your chest free to expand to its uttermost.

And now, in reply to your questions about catarrh and colds, and so on, I have only to say, as I have already done: Keep the blood in the right place, and leave all its channels unfettered by any bands; give the lungs the largest liberty; keep the skin of the whole body active and familiar with fresh air and cold water; do not muffle the neck too much, but be very sure that the feet are so clad that they are always warm. Catarrh in the head and cold feet always go together. Keep the feet warm and dry, and you cannot have catarrh. Do not expect to cure a catarrh by snuffs or any patent nostrum. *Sublata causa, cessat effectus:* The cause removed, the effect ceases.

Above all things, avoid going to sit, stand or lie in a cool, breezy place when you are warm from active exercise. That is a sure way to catch the "death cold." Do not stand by open windows or open doors when the air of the house is warmer than that out. You are subjected to a strong draft which is sure to result in a "cold." Do not stop to talk in the doorway when parting from a friend. Say

what you have to say in the house, and, when you get to the door, go on your way at once.

Do not arrest a friend on a windy corner when walking, for a five minutes' chat. You may both get chilled fatally. Rather turn and walk in your friend's direction till your chat is over.

Do not throw off your wraps too suddenly when coming in warm with exercise, but "let your moderation be known to all."

Do not talk much when walking in a cold, frosty air, but keep the mouth closed, that the air may be warmed by the nostrils.

Avoid very hot rooms, with the moisture all dried out of the air. Have a thermometer, and never tolerate a temperature above sixty-eight or seventy Fahrenheit.

Change the air of your room every hour. An hour is long enough to remain in one position or in one room without change. Never sit, eat or sleep in a north room if you can help it. The north side of the house belongs to the refrigerator and the store-room. Let the sun shine into all your rooms as much as possible. You had better have faded carpets than faded faces. Be out doors two hours a

day at the very least, and in fine weather let it be three or four. There is always something to go out for. Every page of Nature's story-book is full of interest to her who will read it. The stones are always there to tell their sermons; the everlasting hills, "whence cometh our help," are always there to remind us that there is too much grandeur in Nature for man to waste his time on strife and contention; and when the glad spring, summer and autumn days come, what a joy there is in studying the flowers, the ferns, the butterflies, the birds and all the fair living creatures that people the woods and fields.

Not time! do you say? But, my dear child, think of the time you put into filling canvas with yarn, in a vain attempt to make something which looks like a flower. Had it not better be spent in studying the flower itself? Believe me, when you learn to study Nature's book with the loving heart and eye of an Agassiz, you will be so accustomed to the real air of life that you will wonder how women can be content to stay indoors and make "pretty things to wear," with a great many pounds of not only superfluous, but act-

nally ruinous (in more senses than one), ruffles and furbelows, when they can be so much healthier, wealthier, wiser and happier in simple attire, whose modest hues are lighted by the glow of cheeks whose bloom rivals the rose's, and by eyes whose sparkle rivals the sunlight.

Finally, keep your noses educated up to the requisite point for the recognition of an air unfit for breathing. For that purpose the sense of smell is given you, and when it tells you the air of a place is foul, get out of it as quickly as you can, unless there is some way of bettering it so as to fit it for respiration.

I once heard Mr. Beecher tell a crowded audience in Steinway Hall, New York, that there was no subject so much talked about and so little understood as the subject of ventilation, and that the air of that hall justified the assertion. He went on to say that, if we were asked to take into the mouth what had been once ejected from it, we should think it a very filthy thing; but we do a much more filthy thing when we take into our lungs not only the breath we ourselves have ejected, but that of our neighbors, too.

In the November, 1877, number of the "Popular Science Monthly" Dr. Felix Oswald has an interesting paper on "Modern Troglodytes," which you will do well to read. It will help to convince you that pure air and plenty of it, and large lungs in which to receive it, are the essential elements of that beauty which you all covet, and which is found only in healthy bodies which have retained that likeness to their Maker expressed in the statement of the sacred historian, "So God created man in his own image."

CHAPTER VII.

THE BRAIN AND NERVES.

"Both in man and woman, the brain is the conservator of strength and the prolonger of life. Poor brains, like weeds, will grow on any soil. The best brains are built by education in accordance with the plans of Nature. A human brain is the "consummate flower" of Nature's development on this planet. No perfect brain ever crowns an imperfectly developed body."—Dr. Edward H. Clark ("The Building of a Brain").

In our previous studies we have considered the different organs of the body principally with reference to their individual functions. We come now to the consideration of the manner in which all these functions are coördi-

nated so that a perfect harmony of action is secured throughout the entire structure. This harmony is the condition we call health, and the system of apparatus by the action of which it is insured we call the nervous system.

There is no form of animal life in which this coördinator of animal force is wanting. True, its manifestations are exceedingly simple in the lower forms, but it requires only the slightest touching of the tentacles of the sea-anemone to reveal its sensitiveness; and if we follow up this contact with the microscope and patience, we shall find the little threads of nerves, radiating from their nervous centers, by whose action the creature is able to so coördinate its sensations with its motions as to withdraw its tentacles from the point of contact. And all this in a creature which spends its whole life on the rock where that life began, and which looks so very much like a flower that it has received a flower's name! If we rise a step higher, to the star-fish and sea-urchin, we have not only no difficulty in proving that they have nerves and nervous centers, but we can easily find them without the microscope. So, if we pass from the radi-

ates to the articulates, we shall find an even more elaborate system of nerves and nerve-centers, by which these creatures are rendered extremely sensitive, and also extremely motor, so that the bee and the butterfly are almost all motion.

As we pass on to the vertebrates we find, first, a notable difference in the location of the nerve-centers as compared with the articulates, in that they are ranged along the lower or ventral region in the latter sub-kingdom, while all the vertebrates have their spines in their backs. Here, too, in the vertebrates we find, for the first time, a bony case for the lodgment and protection of nerve-centers; hence they are the first to possess two quite distinct nervous systems, namely: the cerebro-spinal or voluntary system, and the sympathetic or involuntary system; the former, as its name indicates, presiding over all voluntary action, while the latter is confined to the regulation of such involuntary acts as breathing, the beating of the heart, and the digestion of food.

There is quite a marked difference in the tissue composing these separate systems, as you would easily see on inspection; and their differ-

ence in function is at once apparent when you recall the ease with which you open and close your eyelids, as compared with the difficulty of holding your breath for a few seconds.

To the naked eye, the brain and spinal cord—which constitute the center of the voluntary system, and which are lodged in the skull and in the long canal formed by the succession of openings in the body of the vertebræ, of which we spoke in an earlier lesson—are composed of two differently colored substances, which are called the white and the grey matter.

Examined with the microscope, this matter is made up of fibers and cells, and microscopists have decided, after much careful study, that the cell portion alone is capable of generating nerve force. Examined chemically, this matter is found to consist of more than three-fourths water; while the phosphates, of which we spoke in the opening chapter under the designation of the "dust of the earth," contribute largely toward the remaining fourth. In this revelation of chemistry, which is but one of many facts both useful and beautiful which that wonderful science reveals, we are fortified in the assumption contained in the

chapter on Foods, that eggs and the whole grains, crushed into edible form, constitute the best brain food, in that chemistry teaches that the germs of all life, both animal and vegetable, are rich in phosphorus, the "light-bringer."

If you look at the brain of any of the higher vertebrates (and any market will furnish you the opportunity), you will see that it is thrown into convolutions. In this respect the brains of reptiles and of birds differ from those of the higher vertebrates, in that the former have no convolutions, and this fact has much significance as related to the degree of intelligence; so that, although size is also an important factor, the brain of the civilized man being larger by nearly thirty per cent. than the brain of the savage, it is nevertheless true that anatomists rate intelligence quite as much according to the fineness of the brain convolutions as by the size of the organ: quality, not quantity, being the rule here as elsewhere.

You may have observed heads with very prominent foreheads, or with excessive development upward, and possibly have been led to infer that their possessors had more than ordi-

nary intelligence, but it is probable that a closer acquaintance would fail to confirm your assumptions. If you look at the heads of any of the Greek statues—which are models, for all time, of the perfect human form—you will note, above all other characteristics, their perfectly exquisite symmetry, while their size often provokes the comment that the Greeks must have had small heads.

We have spoken, thus far, only of the nerve-centers. We have now to speak of the nerves which have their origin in these centers. From the brain and spinal cord there arise forty-four pairs of nerves, twelve of them from the brain and thirty-two from the cord. The cord itself is described as having four columns, two anterior and two posterior; and the very interesting fact that each of the spinal nerves has a double root, one coming from an anterior column and being exclusively motor in its function, the other coming from the posterior column and being exclusively sensitive in function, was never known until the present century, when Sir Charles Bell discovered it in 1810, his discovery being confirmed by Magendie in 1822. Magendie divided, in the living

animal, first the posterior roots, and found that sensibility was lost, but that motion remained. Then he divided the anterior roots, and obtained reverse effects.

Knowing this fact, the series of actions which goes on between the fibers which go to make up any pair of the nerves which animate the trunk muscles or the muscles of the extremities may be aptly likened to an exchange of messages between two telegraphic stations. The finger, for instance, touches an offending object. The sensitive fibers of the double-rooted nerve which animates the finger carry in the announcement to the central office, or spinal cord, that something hot is at the other end of the line, from whose proximity it will be expedient to withdraw. The order is at once issued to the motor fibers to attend to the withdrawal. This is the analysis of every voluntary muscular action, and not only this, but the time occupied in the transit of the separate messages from without inward and from within outward has been estimated.

We turn now from the spinal nerves to the consideration of some of the twelve pairs of cerebral nerves whose origin is limited to a

very small space at the base of the brain, and to whose presence we owe our special senses of smell, sight, hearing and taste in a similar way to that in which we derive sensation and motion from the spinal nerves.

Says Gerald Massey: "There are many ways in which the Creator seeks admittance into the soul of man.... We see the flowers come to us every springtide, with messages uttered in lovely forms, and in fragrance which is the breath of the Divine. The winds blow, waters roll, the green leaves dance, the sunbeams brighten, the colors burnish into beauty, the weeds grow in grace, the skylark mounts up, and 'deep calleth unto deep, day unto day uttereth speech'; the springing earth laughs out in the light, the starry heavens kindle all aglow with the glory of God.... All nature reflects in some faint wise, in its infinite variety, the Image of the Infinite One. It is as if in man Nature found her heart of hearts—her true meeting-place for the Creator, the Creation, the Creature."

And our five special senses may be regarded as the several gateways through which the Creator comes into our souls by these gracious

manifestations of Himself. We are accustomed to call them five separate and distinct senses, yet closer thought suggests that the senses of smell, sight, hearing and taste are but so many modifications of the sense of touch, for do not the odorous particles which float off from the anthers of the rose impinge upon the terminal filaments of the nerve of smell, and by this contact give proof of their presence, as directly as the hot stove declares itself to the finger-tips through the general sense of touch?

Consider the sense of vision. Socrates asked: "Does it not look like a work of prescience, because the eye is so delicate, to have furnished it with lids, which open when we want to see the light and close when we want to sleep; to have fringed those lids with lashes, which, like a seive, strain the dusty wind and keep it from hurting the sight; and over the eyes to have placed brows, which, like eaves, carry off the sweat from hurting the sight?"

Let me entreat you, dear girls, to think of all this careful provision for the needs of your eyes, when you are tempted to hang a spotted lace veil before them to enhance the color of your cheeks, and forbear thus to profane and

irritate these most delicate organs. You can hardly offend the nerve of vision more seriously than by following this pernicious fashion. Your brothers would never endure such a thing as a veil before their eyes, but would protest against it with all possible vigor, and your eyes are made exactly like theirs.

If you would see the mechanism of the eye—which is but the servant of the nerve of vision, sent off from the brain—you can easily get the eye of an ox from your market, and examine it at your leisure. Note through what a variety of media the light must pass before it is permitted to impinge upon that delicate expansion of the optic nerve which we call the retina! Just as you saw that the mouth is the preparatory organ for digestion, the nose for olfaction, so you see that the eye is the preparer of light for the brain. Treat the eyes properly, and they will remain your faithful servants for all your threescore and ten years, provided you treat the rest of your body as you should. Abuse them, and there is no power in Heaven or on Earth which can prevent you from paying the penalty therefor.

Do not hang veils before them; do not

bend over book or work, but sit always erect, and raise the book or work to the requisite height. Use an inclined book-rest for heavy books. Raise the eyes from the book as often as two or three times in the half hour, for a restful look off into the distance—"to the hills whence cometh our help," if possible—and let the mind have time to think of the subject-matter. Do not sit with the light opposite the eyes, whether that light be sun light or artificial light, but let it fall over the left shoulder, directly upon the page or the work. Never read or study by artificial light before breakfast. It is ruinous to the eyes. Do not read or sew by twilight. If the eyes require protection from sun-light or snow-light, or light reflected from water, or if the lids fail "to sift the dusty wind," obscured glasses are better for the purpose of protection than veils.

The sense of hearing has the ear for its servant, and of all the organs of special sense this is the most complicated and the most beautiful. It is impossible for me to convey to you, by words, any idea of this most marvelous structure; but let me ask you to study a model of it at your first opportunity, and I feel sure

you will thus find your whole soul so filled with reverence for the Maker of such a piece of workmanship that you will shrink from profaning its pavilion, as the external part is called, by punching a hole in it for the exhibition of an ornament, which, however beautiful it may be, is a desecration to this "temple of the Holy Ghost."

Keep these gateways for your Lord's incoming ever open and ever in order; so shall you live in that nearness to Him which the "pure in heart" know, "for they shall *see* God." Do this "in the days of your youth," so that when you reach your meridian your brains shall be richly stored with the records of the impressions which the servants of the nerves will have brought in. So shall your last days be better than your first.

Dr. Draper tells us that "a shadow never falls upon a wall without leaving there an indelible trace, a trace which might be made visible by resorting to proper processes. Upon the walls of our most private apartments, where we think the eye of intrusion is altogether shut out and our retirement can never be pro-

faned, there exist the vestiges of all our acts, silhouettes of whatever we have done.

"If, after the eyelids have been closed for some time, as when we first awake in the morning, we suddenly and steadfastly gaze at a brightly illuminated object, and then quickly close the lids again, a phantom image is perceived in the indefinite darkness beyond us. We may satisfy ourselves that this is not a fiction, but a reality, for many details that we had not time to identify in the momentary glance may be contemplated at our leisure in the phantom. We may thus make out the pattern of such an object as a lace curtain hanging in the window, or the branches of a tree beyond. By degrees the image becomes less and less distinct; in a minute or two it has disappeared. It seems to float away in the vacancy before us. If we attempt to follow it by moving the eyeball, it suddenly vanishes. Such a duration of impressions on the retina proves that the effect of external influences on nerve-vesicles is not necessarily transitory.

"In this there is a correspondence to the duration, the emergence, the extinction of impressions on photographic preparations. Thus,

I have seen landscapes and architectural views taken in Mexico, developed, as artists say, months subsequently in New York: the images coming out, after the long voyage, in all their proper forms and in all their proper contrast of light and shade. The photograph had forgotten nothing. It had equally preserved the contour of the everlasting mountains and the passing smoke of the bandit-fires.

"Are there, then, contained in the brain more permanently, as in the retina more transiently, the vestiges that have been gathered by the more sensory organs? Is this the explanation of memory—the Mind contemplating such pictures of past things and events as have been committed to her custody? In her silent galleries are there hung micrographs of the living and the dead, of scenes that we have visited, of incidents in which we have borne a part? Are these abiding impressions mere signal-marks, like the letters of a book, which impart ideas to the mind? or are they actual picture-images, inconceivably smaller than those made for us by artists, in which, by the aid of a microscope, we can see, in a space not bigger

than a pin-hole, a whole family group at a glance?

"The phantom images of the retina are not perceptible in the light of day. Those that exist in the sensorium in like manner do not attract our attention so long as the sensory organs are in vigorous operation and occupied in bringing in new impressions. But, when those organs become weary or dull, or when we experience hours of great anxiety, or are in twilight reveries, or are asleep, the latest apparitions have their vividness increased by the contrast, and obtrude themselves on the mind.

"For the same reason they occupy us in the delirium of fevers, and doubtless also in the solemn moments of death. During a third part of our life, in sleep, we are withdrawn from external influences; hearing and sight and the other senses are inactive; but the never-sleeping Mind, that veiled enchantress, in her mysterious retirement, looks over the ambrotypes she has collected—ambrotypes, for they are truly unfading impressions—and, combining them together as they chance to occur, constructs from them the panorama of a dream...

"Savage or civilized, we carry within us a

mechanism which presents us with mementoes of the most solemn facts with which we can be concerned. It wants only moments of repose or sickness, when the influence of external things is diminished, to come into full play, and these are precisely the moments when we are best prepared for the truths it is going to suggest. That mechanism is no respecter of persons. It neither permits the haughtiest to be free from the monitions, nor leaves the humblest without the consolations, of a knowledge of another life. Open to no opportunities of being tampered with by the designing or the interested, requiring no extraneous human agency for its effect, but always present with every man, wherever he may go, it marvelously extracts from vestiges of the impressions of the past overwhelming proofs of the realities of the future, and, gathering its power from what would seem to be a most unlikely source, it insensibly leads us, no matter where we may go, to a profound belief in the immortal and imperishable, from phantoms which have scarcely made their appearance before they are ready to vanish away."—*History of Conflict Between Science and Religion.*

CHAPTER VIII.

NERVES AND NERVOUSNESS.

Having considered the structure and functions of the cerebro-spinal or voluntary nerve system, it remains to speak more in detail of the great sympathetic or involuntary system, whose nerve-centers, or ganglia, have no bony case for their lodgment, and in this respect are allied to the nerve-centers of the radiates, the mollusks and the articulates, being distributed about among the various internal organs of the four cavities of the body, namely: the skull, the chest, the abdomen and the pelvis. Besides these, there is a double row of them lying against the anterior surface of the spinal column, which might be compared to a double string of loosely-threaded pearls, so far as the

appearance which they present to the naked eye is regarded.

From these various ganglia, of which it is estimated there are upward of sixty in the heart alone, numberless delicate nerve filaments are given off from each internal organ, which unite not only with similar filaments from neighboring organs, but also with filaments sent off from the cerebro-spinal nerves; by which means you will understand that all the internal organs are not only intimately associated with each other, but also with the body which they inhabit. It is this fact which gives the name "Great Sympathetic" to this system. It is also called the "Great Organic," for the same reason. To the microscopist and the chemist the structure of this system presents some significant variations from that of the cerebro-spinal system; while to the physiologist there is a very wide variation in function, in that a very much longer space of time is requisite for conveying impressions to its centers than is required to convey messages to the brain or spinal cord

Thus, if the hand or foot come in contact with a cold or hot foreign body, the intelligence

is carried in to the brain in less time than it takes to describe the process even to the extent here attempted; but if we "catch a cold," as the expression goes, the sympathetic nerve-centers do not evince their recognition of the fact until twenty-four hours or more after the occurrence which gave rise to the condition.

There is another very important fact connected with this sympathetic system, namely: that, although the entire weight of the internal organs is only about one-tenth that of the body, yet one-half of all the blood of the body is sent to these organs. I desire to impress this fact upon you with all possible emphasis, for upon its recognition your comfort depends in large measure. You will remember that in the chapter on "Circulation" I have endeavored to impress upon you the fact that physical suffering generally implies blood in the wrong place, and that all remedial measures point to a removal of it to some place remote from the seat of pain.

Now you all understand that the nerves are the sentinels which report this want of equilibrium in the circulation, by means of an ache of some kind. Not one of them will allow an

excess of blood in its vicinity without protesting; therefore, I say again, as I have already said to you, Keep the blood clean and in the right place, and your nerves will never give you painful reminders of their presence.

All painful, inflammatory conditions, like pneumonia, dysentery, and uterine, or ovarian, inflammations, mean this and nothing more. I knew a young lady who stood with her head out of an open window for five minutes, in mid-winter, to gossip with a passer-by. In twenty-four hours she had the initiatory chill of pneumonia, and in a week the passer-by attended her funeral.

I knew another, who played croquet on the damp ground in early May, going directly out from a warm dining-room, with thin shoes and but little protection from a cold wind. A violent attack of dysentery followed, from which she barely escaped with her life.

Neuralgia has been defined as the "prayer of the nerve for healthy blood," but the nerve prays no less fervently for the right quantity than for the right quality of the vital fluid.

Doubtless many of you have felt the pangs of neuralgia, and would like to be informed

how to avoid their recurrence. Let me tell you, then, right here, that all the anodyne lotions and doses which ever were or will be compounded will never cure neuralgia as long as the cause of it remains, and, in nine cases out of ten, the cause of neuralgia in young women is traceable to want of equilibrium in the circulation. The poor body is so cramped and distorted and loaded down with the thousand and one devices for making it look "stylish," that the blood has very hard work to get round it at all, to say nothing of getting round on time.

Take the "corset-liver," for instance, as medical students have learned to call the livers of the female subjects which go to the dissecting-room. It is the rule, rather than the exception, for these livers to be so deeply indented where the ribs have been crowded against them by improperly worn clothing, that the wrist may easily be laid in the groove. And this in an organ which is a mass of blood-vessels, through which every particle of blood ought to circulate freely on its way to the heart. Of course, it cannot get through the squeezed portions, and the inevitable result of

the half-done work of the liver is an unclean condition of the blood, which utters its cry by means of aching nerves.

"A sick simpleton asks, What shall I take? A sick philosopher asks, What shall I do?"

"What shall I take for my nervousness?" is the question which comes daily, I might almost say hourly, to the physician—"that unfortunate individual," as Voltaire said, "who is hourly expected to perform a miracle; namely: to reconcile health with intemperance."

All nervous people are intemperate in some respect, because they are deficient in that fundamental element of stability, *self-control.* There would be no need of any temperance-reform movements if we were all taught the proper lessons of self-control in childhood. The woman who stimulates herself to extra exertion on strong tea is just as much an inebriate as he who rolls in the gutter because he stimulates on alcohol; and the young girl who never can pass a candy-store without indulging in her favorite sweets is just as surely on the road to ruin, of one kind, as is the boy who prides himself on being able to smoke cigars. The animal appetite is master in each case, and

self-control is as deficient as in a creeping infant, who has no higher thought than to eat as often and as long as it can.

Inactivity ranks next to intemperance as a fruitful cause of nervousness. Some of "our girls" are fond enough of activity of a certain kind. They can dance all night and "never feel tired," but they cannot walk a mile without getting the back-ache; so they will shut themselves indoors all day, away from the life-giving air and sunlight, and read emotional novels, and then go to the doctor to get some valerian for their nerves! Alas! poor souls! If you would only go to the woods and to the fields, to the rocks and to the streams, for your books, and let the novels lie on the shelves till your mothers tell you which ones to read! And then if you would spend your evenings with the best authors, and go to bed at nine o'clock, and do your dancing by sunlight, you would never know anything about nervousness.

"Nervousness and hypochondria and hysteria were unknown to the ancients. Perhaps if we emulate them, seeking to be as strong as the Romans, as high-minded as the Greeks,

they may in time be unknown to us." Good muscles are the best possible balance for the nerves. People who use their muscles as they should never have hysteria. Nor yet do people who use their brains as they should have it. Well-directed mental effort never yet made a case of hysteria, nor of its relative, insanity. It is intemperate brain-work, with worry, which leads astray.

In the annual reports of the Massachusetts Lunatic Asylums for 1876, the superintendents all concurred in asserting that "there can be no permanent decrease in the number of the insane till people learn to control their passions, sleep well, and 'keep cool.'

"Children and older students must take exercise, and the robust and vigorous must be taken from cruel exercise and sports, and put to study and more placid employments. Self-control is, above all things, essential. The marriages of those tainted with insanity should be forbidden. Brain-workers contribute a very immaterial percentage to the total number of the insane."

It is a perfectly easy matter to select from a school of young ladies those who will be

liable to attacks of hysteria at the test examinations of the closing weeks of the term; and they will not be those who have been "temperate in all things," and faithful not only to each day's mental work, but faithful also to the body, in which the mind dwells, as regards its daily need of sunlight, water, fresh air, and exercise.

The intemperate ones are they who will, under the spur of some excitement, walk ten miles one day, and then stay indoors, wrapped in shawls and drinking tea, for a week after it. They will sit up all night to "cram" for an examination, when those who have done every day's work in its own good time are quietly refreshing their brains for the test-work by that best of all restorers—blessed, balmy sleep. The "crammers" will fidget and worry and make "great cry, but little wool," and when they are informed that they have fallen short of the mark they will fly off into hysteria like any poor crazy-brained creature. Then the opponents to the higher education of women come in and say, "I told you so! That's what comes of cramming girls' heads full of Greek and Latin and science and all that

stuff, that's of no use to 'em! Better let 'em stay at home and wash dishes!"

Quite right! That kind of girls had better stay at home and wash dishes or darn stockings, so that they do it well, than to make such a pitiful pretense at brain-work. Not what you do, but how you do it, is the test of your capacity.

> "Who sweeps a room, as by thy laws,
> Makes it and the action fine."

The third factor, in addition to *temperance* and *activity*, which is requisite for healthy nerves is *cleanliness*, as applied not only to the body itself, but also to the air which surrounds it, and to the clothing which covers it. It is asserted by good medical authority that unventilated clothing tends greatly to aggravate rheumatic complaints by its retention of the acid excretions of the skin. All clothing should be frequently exposed to direct sunlight, as should the body which wears it. So should all bedclothing and beds be daily exposed to this most beneficent agent when clouds do not obscure it.

It is considered by some a proof of a very neat housewife when all the beds are made

while the family are at breakfast; but to the physiologist there could hardly be a more repugnant proof of untidiness. Indeed, I know of a lady who lives in a fine house where no window is opened from October till May. She has her bed made as soon as she and her husband leave it, and wonders what her neighbors can be thinking of to open their bedroom windows in midwinter. Her children have all died but one, and he is getting ready to go. He sleeps till nine or ten o'clock in the morning, and always wakes with headache. He goes at once for mince-pie and jelly-cake, which are always at his command, and accompanies them with sausage and doughnuts. His breath is simply *horrible*, his complexion is like that of a withered and sickly old man, and he is a constant sufferer from neuralgia or headache. The blood of such a body is unclean beyond comparison, and "there is no health in it."

Let us hear what Mr. John Weiss says about the health of the "Women of Shakespeare":

"Shakespeare contrived to rear a race of women whose physical soundness was unim-

paired. Before the gymnasium and health lift were invented by the peevish persuasion of dyspeptics and invalids, who die by inches of fried food, furnace-air, fricassees of high-school programmes, and *ragouts* of French novels, his women earned their health on horseback in the broad English fields; they called it down to them out of the sky where the hawk struck the heron and returned to perch upon the wrist; they came upon its track in the sylvan paths which the startled deer extemporized; they overtook it in long stretches of breezy walks upon the heathery downs and in the hawthorn-bounded lanes. The country's nature was their training-room, and its unsophisticated habits their masters.

"They saw the sun rise, and could not afford to outflare the setting crescent with gaslight streaming from overheated rooms; nor did the stately minuet ravage like the "German" which is sustained into the small hours upon rations of beef-tea and various liquors. They drank small-beer for breakfast, and knew the taste of herrings before the Turks invaded the nerves of Christendom with coffee and the Chinese began to tan its stomach with the acid

of tea....Not one of Shakespeare's women utters one line that is inspired by any form of hysteria; the perfect balance of the functions was not yet impaired, so that no nerve-center could exercise a petty tyranny, nor suggest the morbid fancies and curious superfluities which dedicate so many late romances to St. Vitus, the patron of spasm....Nature was so prodigal of health to Shakespeare's women that it overflowed the clay-banks of their bodies, and spread in a freshet of gayety."

Some of you have come to me with questions about headache, about neuralgia, about nervousness, about sleeplessness, and so on, and often you ask me for "*something to take*," as if the doctor had only to put the hand in the medicine-chest and send a remedy direct to the seat of pain. My dear girls, let me tell you, once for all, that the medicines which cure all ills to which flesh is heir are found only in the advertisements. The true physician effects more by his teaching than by his drugs.

If you are suffering from headache, it is probably due either to errors in diet, or to fatigue, or to "a cold in the head," or to a

constitutional tendency to neuralgia, either inherited or acquired. In either case the remedy is the same—*rest.* If the stomach has been offended by too much food or by too great variety (either will cause headache), by all means give it rest. Take a twenty-four-hour fast, and give Nature a chance to do her own repairing. She is mighty to prevail if you let her alone. We all incline to eat more than we need when the palate is pleased, and it is estimated that where one dies of starvation ten die by overfeeding. The Church of Rome does wisely by her children in one respect—as to the matter of stated periods of fasting.

If the head aches by reason of nerve-fatigue, there is no remedy like sleep; and the way to court sleep is to take a warm foot-bath and then firmly resolve to go to sleep. If the mind, owing to the temporary failure of the nerve-power to control its vagaries, tends to go roaming about in such crazy fashion as to repel the sleepy god, then is the time to summon up your self-control. You can, if you will, make it stay at home and count sheep going over a wall; or any other simple device by

which it is kept steady will suffice to allay that restlessness which drives away sleep.

Boswell tells us that a few days before the death of Dr. Johnson, when his physician arrived to pay his morning visit, he seemed very despondent, and broke out in the words of Shakespeare:

"'Canst thou minister to a mind diseased;
Pluck from the memory a rooted sorrow;
Raze out the written troubles of the brain;
And, with some sweet oblivious antidote,
Cleanse the stuffed bosom of that perilous stuff
Which weighs upon the heart?'"

To which the physician replied, quoting from the same great poet:

"'therein the patient
Must minister to himself.'"

Johnson expressed himself much satisfied with the application.

On another day, when talking on the subject of prayer, the Doctor repeated from Juvenal: "'*Orandum est, ut sit mens sana in corpore sano.*'"

Let us now briefly recapitulate the essential conditions for healthy brains and nerves: First, *be temperate in all things.* Eat and drink such things only as will contribute to

the building of good blood, in accordance with the instructions already given you. Let, also, the times and the manner of taking the food be regulated in accordance with those instructions.

Be temperate in your observance of the proper hours of study and reading. Mental indigestion is just as sure to result from inordinate cramming with book-lore as is gastric indigestion sure to follow food-cramming. Be temperate in respect to your hours of waking and sleeping. Nature puts her flowers and her animals to sleep along with the going down of the sun, and no human being can disregard this example to the extent of turning night into day without, sooner or later, paying the penalty in shattered nerves. The best hours for sleep are those between ten and two, and no amount of sleep prolonged into the daylight can compensate for the loss of these precious hours. Be ready for bed at nine o'clock in the evening, and you will have no disposition to linger in bed after the sun rises.

Be temperate and systematic in your observance of hours of exercise in the open air,

and never, under any circumstances, allow yourselves to study in the hour which should be devoted to exercise. Such study is a weariness to the flesh, and also to the brain and nerves. You have probably threescore and ten years to live, if you live as you should, and there is time enough to do all your work *well* in that time. Do not endeavor to crowd just so many lessons into one term because your companion does so, but let each one be guided by her own individual capacities. Think now totally immaterial it will appear to you ten years hence whether you graduated with your own class or with the following one.

Be temperate in your attention to personal adornings. Much valuable time is wasted upon personal attire. It is the duty of each one to *always* look just as beautiful as she can, and no young girl can fail to look beautiful if she is in perfect health, her entire apparel in perfect order, her hair tidily and tastefully arranged, her teeth and nails perfectly clean, and her dress made in the simplest possible manner consistent with the prevailing mode. The young girl who presents herself at the breakfast-table with half her hair in crimping-pins

and the other half in a frowsy state, her feet in shabby shoes or slippers, her dress half adjusted, her collar and cuffs, or ruffles, soiled and crumpled, and everything about her in disorder, can never appear beautiful to the eyes that behold her thus, no matter how much she may strive to adorn herself for the evening dissipation. Such a girl is sure to be intemperate in her conduct of life.

Secondly, *be active* in all good ways, if you would be free from neuralgia and nervousness. Idleness is no less the parent of hysteria than of other vices. People who lead busy lives never find time to have hysteria. Be active in the open air. The sun should never set on the day when you have failed to be out an hour or more in the open air, unless the weather is exceedingly inclement. Ladies of the present day—thanks to the great improvement in outdoor attire—can go out in all weathers as perfectly secure from ill effects from exposure as their brothers can.

We each must have a pound of oxygen per day to consume the waste matter whose accumulation in our blood causes neuralgia, and we cannot get it even in the best ventilated apart-

ments. We must go outdoors for it, or we shall pay the penalty of our neglect by despondency, by neuralgia, by hysteria, and perhaps, eventually, by insanity.

Thirdly and lastly, *be clean.* Probably few, if any, of you are negligent of the use of soap and water to the extent of the ordinary demands of propriety; but I have not failed to observe a disregard of the fact that cleanliness consists in constant vigilance. By this I do not mean that restless scrutiny which leads fussy housewives to be forever armed with the duster, the broom and the fly-chaser, but I refer to that timely forethought which forbids us ever to incur the risk of leaving any accumulations of decomposing animal or vegetable matter where it can taint the air.

I have seen young ladies allow the water to stand in vases of flowers until the air of the room was foul with emanations therefrom. I have noticed that young ladies who wear corsets often continue to wear them unwashed so long that the odor of the perspiration from the axillæ announces their presence even before one sees them. These are but few of many little points of nicety in regard to our personal

habits the sum of which constitutes cleanliness.

I need not remind you that if you engage in the occupation of street-sweeping as your voluntary contribution toward the sanitary good of the city, the skirts which you use for this purpose should be changed before you enter the drawing-room. You certainly would not invite the man who is hired to do this work into your parlor until he had first changed his clothes, and you certainly must be as untidy as he, even though yours has been a labor of love where his has been hired service. Of course, it is evident that each of you also needs to go to the bath as often as you engage in this occupation.

The last cause of unclean blood of which I have to speak is that very common condition of the alimentary canal known as obstinate constipation. Ask any physician what he or she is oftenest called upon to treat among women who wear corsets, and who spend much time in sedentary, indoor occupations, or in idleness, and you will find it to be this. It is the inevitable result of such lives, and the foul breath attending the condition is only one of many accompaniments, all of which combine,

at frequent intervals, to induce an aching head or a violent attack of neuralgia in some one or more sets of nerves. Such people are good patrons of patent pills, and are never without them. Uncleanness is stamped upon every drop of blood, where such a condition prevails, and the only blood-purifiers for those who are thus afflicted are fresh air, with large lungs for its inhalation; fresh water, with plenty of clean towels for rubbing the skin, and heroic doses of muscular exercise in garments which leave the diaphragm and all the muscles of the abdomen as free to move as if the body had no covering but its own.

CHAPTER IX.

HOW PLANTS AND ANIMALS ARE PERPETUATED.

We have confined ourselves, thus far, to the study of the individual life of different animals. We come now to the consideration of the mode in which their succession is insured.

Your observation of plant life, however limited it may have been, has shown you that no plant, however simple its form or however humble its place on the pages of Nature's book, ever dies without having first matured some seeds or spores by which its type is destined to be maintained. Its whole life, whether it be long or short, points forward to this, its ultimate office. The delicate fronds of the ferns continue to grow in strength and verdure and beauty until their spore-cases mature, and then

they droop and wither and return to the dust from which they came. So the violet and the anemone, the rose and the clematis, the aster and the golden-rod, and all the other bright attendants of the swift-going seasons, grow in grace and beauty until their seed-cups, or ovaries, have matured, and with that maturing their lives begin to decline and they to tend downward to the sheltering arms of Mother Earth, from whose bosom they sprang and to whose bosom they return.

As with the plant, so with the animal. The ovule of the former and the ovum of the latter carry the potential successors of the parent life. If the animal expels its ovum for a period before the young is matured, and keeps it warm in a nest with its feathers, as the bird does; or leaves it in the sand, to be kept warm there, like the turtle; or leaves it on the river bank, to be warmed by the sun, like the fish—it is said to be an oviparous animal: but if it carries its ovum in a uterus, instead of laying it in a nest, until its little one is ready to begin its visible existence, it is said to be a viviparous animal. All animals which bear their young alive are also called mammals,

from the Latin *mamma*, a breast; because they all feed their young at the breast. Some mammals, like the whale and the seal, live in the sea, but most of the mammals are land-dwellers.

Every form of infant life, whether that life be vegetable or animal, has its father and its mother; and in all cases, whether the infant life be that of a violet, a bird, or a child, its mother has the larger and more responsible share in the work of its maturing. To each one of you, dear girls, is assigned this holiest and highest of all human responsibilities, namely: the bearing and rearing of your own young, and to you each is assigned a special set of organs, separate from any of those we have yet studied, yet associated in very close relation to them by means of the "Great Sympathetic" nerve system of which we have already spoken.

These organs, in mammals, are called the ovaries and uterus. They are located in a cavity with firm, bony walls which we call the *pelvis*, or basin, and this cavity joins the abdomen. By a neglect of the laws of health touching these important organs the woman who is not in some way afflicted with a female weakness is the exception and not the rule.

is true of the ovary of the mammal. Nothing could be more completely guarded from external injury than are these very important organs, as regards their location, encased as they are in the firm bones whose upright edges you feel when you rest the hands upon the hips. Those bones constitute the brim of the *pelvis*, or basin, in which the ovaries and uterus are lodged.

The ovaries are about the size and shape of an almond, one on each side of the median line. They consist of a mass of very small *ova*, or eggs, much too small to be seen by the naked eye, each one of which is inclosed in a sac of its own, and at regular intervals, after you cease to be little girls, one of these little eggs is matured and escapes from its sac into the uterus. This is a hollow muscle, about the size and shape of a Bartlett pear, its longest diameter being two and a half inches. When you marry, the escaping egg is retained in the uterus and kept warm and alive until the little one inclosed in its investing membrane or shell is large enough to live separate from its mother. This is the process of reproduction as carried on throughout the entire animal world.

The provisions for its maintenance are no less complete, nor any less adequate for the entire fulfillment of the work intended, than are the provisions for digestion, circulation and respiration, as already detailed. There is no more reason for your being sickly because this high privilege of maternity is accorded you than there is reason for the female portion of the rest of the animal world to be sickly: and we all know that the sickly females, as a separate class from all other created beings, are the human females. The original Eve, made in her Maker's image, and animated with His breath, was not a sick Eve; yet she was made with just the same materials as you, had just the same number of bones, muscles, arteries, veins and nerves, and had just the same sets of organs, namely: the digestive, circulatory, respiratory and reproductive organs.

Alas! how far have we fallen from this high ideal when we have to confess, as we must, that the woman who is not, in some way, afflicted with "a female weakness" is the exception and not the rule! Saddest of all is the fact that woman herself is responsible for this departure from God's plan.

Hopeful to us all is the fact that she may, if she will, learn—nay, that she *is seeking* to learn—wherein she has erred, in order that she may become what God meant she should be: a *companion* for Adam, strong in her womanliness as he is in his manliness; beautiful in her healthfulness as he is in his; and so, fit to become his help, meet for all good works.

Some one says, "Nothing is so conducive to a right appreciation of the truth as a right appreciation of the error by which it is surrounded." We have been trying to study God's woman—the true woman. We are now to search for the causes of the diseases which years have heaped upon her since Eve sprang from the Creator's hand, in the perfect beauty of a healthy womanhood—a womanhood which is to-day, for the greater part, but an ideal in the mind of the poet, the painter and the sculptor.

Said the Hon. Horace Mann: "I hold it morally impossible for God to have created, in the beginning, such men and women as we find the human race, in their physical condition, now to be. Examine the book of Genesis, which contains the earliest annals of the human

family. As is commonly supposed, it comprises the first two thousand three hundred and sixty-nine years of human history. With child-like simplicity this book describes the infancy of mankind. Unlike modern histories, it details the minutest circumstances of social and individual life. Indeed, it is rather a series of biographies than a history. The false delicacy of modern times did not forbid the mention of whatever was done or suffered. And yet, over all that expanse of time, for more than one-third part of the duration of the human race, not a single instance is recorded of a child born blind or deaf or dumb or idiotic, or malformed in any way.

"During the whole period, not a single case of a natural death in infancy or childhood or early manhood, or even of middle manhood, is to be found. The simple record is, 'And he died'; or he died in a good old age and full of years; or he was old and full of days. No epidemic, nor even endemic, diseases prevailed; showing that they died the natural death of healthy men, and not the unnatural death of distempered ones. Through all this time (except in the single case of Jacob, in his old age,

and then only a day or two before his death) it does not appear that any man was ill, or that any old lady or young lady fainted. Bodily pain from disease is nowhere mentioned."

Certainly it does not appear that any such array of "female weaknesses" has ever disgraced womankind in any age as characterize the women of this nineteenth century.

Says Dr. Edward Clark, in his most suggestive and truthful book, "Sex in Education": "Let the statement be emphasized and reiterated until it is heeded, that woman's neglect of her own organization, though not the sole explanation and cause of her many weaknesses, more than any single cause adds to their number and intensifies their power. It limits and lowers her action very much, as man is limited and degraded by dissipation. The saddest part of it all is, that this neglect of herself in girlhood, when her organization is ductile and impressible, breeds the germs of diseases that, in later life, yield torturing or fatal maladies."

Prominent among these maladies are diseases of the uterus, which involve its position. Only just so much space being assigned to it in the pelvis, if it is turned forward or back-

ward or to one side or to the other, there is at once a protest from the nerves of the adjacent organs in the way of pain. The prominent causes of these false positions are, first, the unnatural weight of the organ, which is the inevitable result of a mode of dress which forces too much blood to it; and, second, a flabby condition of its texture, which is the natural result of this habitual congestion.

Not less common than false positions of the organ are unnatural conditions of the mucous membrane which lines it. It is the function of all mucous membranes, when in health, to secrete enough mucus to keep the surface moist. As soon as this mucous membrane becomes unhealthy, this natural moisture increases to the extent known as a catarrhal discharge; and, whether this discharge be a nasal or a uterine one, its character is the same and its cause the same, namely: congestion. This discharge, occurring from the uterus or from the vagina—which is the canal leading from the uterus—is called a leucorrhœa. If it occurs from the nose, it is called a catarrh.

Prominent among ovarian diseases is the condition known as ovarian cyst, where one or

more of the egg-sacs already spoken of become enormously distended with a fluid, because the ovaries have no mucous lining, like that of the nostrils, the uterus and the vagina, by whose help they can relieve their congestion; hence they become "dropsical," since they cannot become catarrhal.

Each and all of these conditions, as we shall see, only express some constitutional derangement of organ or of function, induced by one or more of the following causes, as given by Dr. T. G. Thomas in his work on the "Diseases of Women":

"First—Want of fresh air and exercise.

"Second—Improprieties in dress.

"Third—Excessive development of the nervous system and errors in education.

"Fourth—Imprudence during menstruation.

"Fifth—Imprudence after parturition.

"Sixth—Prevention of conception and induction of abortion.

"Seventh—Marriage with existing uterine disease."

This is a concise and candid statement of the causes of a line of woman's diseases in whose treatment Dr. Thomas has won a world-

wide reputation for success, and the women who daily crowd his office for treatment now are only so many confirmations of the statements above made.

I have no desire, my dear girls, to appall you with any needless pictures of misery. I come to you only with timely warnings, if haply I may lead you to take my ounce of prevention rather than that you go blindly on in your disregard of the laws of health until you are compelled to take Dr. Thomas' pound of cure in the form of a pessary, or some inevitable method of local treatment. This you must unavoidably come to if you persist in weighting down your pelvic organs with long, heavy skirts hung upon your hips; if you persist in compressing your chests with corsets or bands so that their contents crowd upon the abdominal organs, causing them to crowd, in their turn, upon the pelvic organs; and if you disregard any or all of the other laws of health which I have tried to detail to you.

"As in that which is above nature, so in nature itself, he that breaks one physical law is guilty of all. The whole universe, as it were, takes up arms against him; and all na-

ture, with her numberless and unseen powers, is ready to avenge herself on him, and on his children after him, he knows not when nor where.

"He, on the other hand, who obeys the laws of nature, with his whole heart and mind, will find all things working together to him for good. He is at peace with the physical universe. He is helped and befriended alike by the sun above his head and the dust beneath his feet; because he is obeying the will and mind of Him who made sun and dust and all things, and who has given them a law which cannot be broken."—Rev. Charles Kingsley ("Health and Education").

CHAPTER X.

HOW TO BECOME BEAUTIFUL.

We have now studied the four separate stories of the house we live in; have learned something of the furniture contained in each, and have seen how perfectly each separate piece is adapted to its individual uses. We have also learned how all the four stories are brought into the most intimate relations with each other by means of the blood-vessels, which, like water-pipes which go all over the houses made with hands, permeate every cavity and every cell of this most complex structure.

We have also learned that two very complicated nervous systems accompany and animate these many-branched tubes, through which the life-blood circulates, by whose presence each

department is kept constantly informed of the condition of things in all the other departments, so that no one organ or set of organs can suffer derangement without having the fact known all through the house.

"And whether one member suffer, all the members suffer with it. And the eye cannot say unto the hand, I have no need of thee; nor, again, the head to the feet, I have no need of you."

We can easily extend our comparison of the human body with the houses made with hands still further, and liken the blood-vessels to the water-pipes, and the nerves to the gas-pipes, for the nerves are indeed our light-bringers, in that all intelligence is due to them; we shall then realize how entire is this mutual interdependence of all parts of the body.

We might call the pelvis the basement story, for upon the organs contained in it rests the whole weight of the responsibility of the continuance of animal life. So might the abdomen be likened to the cook rooms where rare and fine products are elaborated from raw materials; while the thorax or chest may be likened to the drawing-room, where fair forms

of thought and art are ventilated, and the head may fitly rank as an observatory. Now, we all know that if the basement story is not maintained in the most perfect order, the fact is sure to assert itself in the upper stories, and this is no less true of the houses "not made with hands" than of those which man fabricates, so that a headache is often referable to a wrong state of affairs in the pelvis; indeed, this is one of the commonest causes of headache, and all the headache cures that ever were invented will avail you nothing so long as their cause remains unsought and unheeded.

But we have not yet covered our house, and it remains for us now to speak of the skin and its appendages.

Let us first glance at the long array of materials which Dame Nature has made use of with which to cover her creatures down in the lower ranks of Creation! Note the firm, crusty skin which protects the soft coral insect, and remember that when you adorn yourself with this memento of a departed life you perpetuate the memory of these "Toilers of the Sea" as effectually as you immortalize your friend whose

hair is woven into the ornaments you most prize.

The pearl, too, which lends you its lustrous light, is but the secretion from the soft mantle of skin which invests the mollusk, whether he be oyster or mussel, and which is but the preface to his harder skin—his shell. So, too, the beetle and the bee have their crusty skins, some of them most gorgeously colored, as you know, far beyond imitation by man's device.

Then there are the scales of the fishes; the horny plates of the tortoise; the feathery overcoat of the butterfly, the moth and the bird; and lastly, the woolly and hairy coats of the quadrupeds. What a bounteous storehouse of resources and materials is Dame Nature's workshop!

Let us now confine ourselves to the structure and uses of our own natural covering. If you could look at a very much magnified vertical section of your skin, you would see a most marvelous array of apparatus for keeping you warm in winter and cool in summer, as well as for carrying off your waste material. What a network of minute blood-vessels is there spread out! and how the bright tint of blood, which is all aglow with fresh air and sunlight,

shines through the superficial layer of this wondrous structure! No outward application of paint or powder can possibly compare in beauty with the natural color of a clean, healthy skin.

Emerson says: "The lesson taught by the study of Greek and of Gothic art, of antique and of pre-Raphaelite painting, was worth all the research, namely: that all beauty must be organic; that outside embellishment is deformity.... The tint of the flower proceeds from its root, and the lusters of the sea-shell begin with its existence."

So thoroughly is your skin a part of your body that it reveals as infallibly the state of affairs within as it reports to your nerve-centers the temperature of the air and objects without, by means of the countless nerve terminals which are imbedded in its layers. This complicated network of arteries, veins and nerves is sustained in position by a foundation structure of cell tissue in comparison with whose delicacy and beauty your choicest laces are mere bungling imitations; while all around and about vein and artery and nerve are glands for collecting the perspiration, and tubes for carrying it off—tubes whose whole extent, taking

the entire skin into account, is estimated at no less than twenty-eight miles, while the openings in the skin by which these drainage tubes discharge their contents upon the outside of your body number no less than three thousand five hundred and twenty eight to the square inch in the palm of the hand. Think of allowing this sewage to accumulate upon the body and its garments! Can you wonder that filth and disease go hand in hand?

Besides all this array of tubes and nerves and fibers and glands there are the bulbs in which each individual hair has its origin, and into these bulbs there is poured the nicest of natural pomade, which is elaborated in little oil glands which are put there for this very purpose. A clean and healthy scalp will keep its own hair oiled without any aid from professional hair-dressers, with rancid oils disguised by strong perfumes.

And last of all is that fine array of tactile corpuscles, or little bodies of touch, by which we get that exquisite sensibility of the finger-tips which enables them to act as eyes for the blind. Look at your finger-tips, and note the ridges, which are quite apparent to the naked

eye. Those ridges contain such numbers of these little bodies of touch that Meissner tells us he counted one hundred and eight of them in the space of about one-fiftieth of a square inch on the inner surface of the tips of one finger.

The skin has its own muscles, too, by which it is capable of drawing itself up into little papillæ—the condition known as "goose-flesh." You have seen horses curl up their skins to shake off the flies. Their skin muscles are more highly developed than yours because they are no longer supplied with five fingers, whatever may have been their condition in the ages gone by, and they are obliged to walk upon the tip of the one finger which remains to them.

Let us pass now to the consideration of the uses of all this mechanism. The physiologists have agreed upon quite an array of functions for the skin, namely: protection, secretion, excretion, absorption, regulation of temperature, and general sensation. You have all realized the value of the skin as a *protector* if you have torn it away from the nerve sentinels which are so thickly stationed under its cuticle, and the

bit of court-plaster, or otherwise, to which you at once resort, serves you kindly in that it acts as a temporary substitute for the lost cuticle while your vital forces make a new one for you. The functions of *secretion* and *excretion* have already been alluded to in speaking of the oil glands and sweat glands. The amount of the waste matter excreted upon the skin, by means of the twenty-eight miles of sewer-pipe already mentioned, varies between two and three pounds a day, according to the temperature of the atmosphere. This fact is a sufficient argument in favor of a daily ablution of the whole body.

The function of *absorption* is taken advantage of for the administration of medicines in the way of ointments, liniments, lotions, etc. Anointing or inunction is one of the most primitive methods of medication. Isaiah refers to oil as ointment in medical treatment. The Grecian athletes anointed themselves for their games. Homer, in the Odyssey, says:

"Sweet Polycaste took the pleasing toil
To bathe the prince and pour the fragrant oil."

Juno, in the Iliad, anoints herself with "oil ambrosial sweet," and Venus anoints the body

of Hector with oil scented with roses. In the Roman baths of Diocletian anointing was carried to great perfection, and various spices—among them, cloves, cinnamon, lavender and roses—were used in the process. The rich had precious ointments, which they carried to the baths in small vials of alabaster.

It is recorded that the emperor Hadrian, seeing a veteran soldier rubbing himself against the marble of the public baths, asked him why he did so. "I have no slave to rub me," was the answer. Upon which the emperor gave him two slaves and sufficient to maintain them. Another day several old men rubbed themselves against the wall in the emperor's presence, hoping to be favored in a similar manner, when the shrewd emperor, perceiving their object, directed them to rub one another.

Modern practice favors the use of oils in fevers, especially scarlet fever, where the skin is parched, hot and dry; and it is claimed that thorough inunction not only does not choke the pores of the skin, but actually encourages their opening, forcing the ointment through the outer skin and stimulating the absorbing vessels to take it up.

If, then, the skin, by reason of its absorbent qualities, is capable of taking in what is deemed salutary for it, it is plain that it is no less ready to absorb obnoxious substances which may come in contact with it. This fact is a sufficient argument in favor of frequent changes of the clothing which is worn next the person, and for its thorough ventilation; also for a complete change at night from the clothing worn through the day; also for the most thorough daily ventilation of the bed and its belongings—in short, for supplying it with the purest possible air at all times.

To appreciate the fact that the skin is a *regulator of temperature*, we have only to recall the discomfort of a hot, dry skin as compared with the relief afforded when a natural perspiration ensues, which, by the process of evaporation, speedily reduces the temperature of the whole body. We can also recall the lassitude of a hot summer day when the air is surcharged with moisture to such an extent that the evaporation from the body is checked, and we long to see the sun disperse the heavy clouds, so that our clouds may vanish, too, by the power of his upward attraction.

That the skin is the seat of a most nice *sense of touch* needs no proof. It is even affirmed that the blind are able to tell colors by this sense.

We come now to the consideration of the hygiene of this most complicated texture. It will be plain to you at once that the same rules which govern the other parts of the body are also dominant here. The skin must have plenty of light, plenty of air and plenty of water to insure its health and its beauty. If it is kept perfectly familiar with these three essentials, the whole body will be full of light and air and comfort. Said Mr. John Quincy Adams, in his ninetieth year: "Men and women rarely ever allow the fresh air of heaven to touch any part of their bodies except their hands and face, and even to these the ladies are systematically unjust by wearing gloves and veils. The surface of the beautiful human form requires to be for a certain period of every day exposed to the action of the atmosphere. I take my air-bath regularly every morning, and walk in my bedroom, *in puris naturalibus*, with all the windows open, for a full half hour. I also take a water-bath daily. I read and

write for eight hours a day. I sleep eight hours, and devote another eight to exercise, conversation, and meals. I feel in myself a reserve of bodily strength, which, I think, will carry me to a hundred years, unless I die by accident or am shot or hanged."

Why should not the whole skin have its daily share of air and light and water! Why give it all to the skin of the face and hands! Indeed, the amount of chronic hydrophobia (fear of water) which afflicts the human race is simply astounding, and goes far toward explaining why they suffer, in so many needless ways, from catarrh, bronchitis, fevers, "colds in the head," and rheumatism. You will never find that a person whose whole skin knows the daily luxury of an air and water bath is in the habit of "taking cold."

The importance attached by the hardy Romans to baths is evidenced by the number and magnificence of such establishments: that built by Diocletian accommodated three thousand at a time. Moses and Mahomet made cleanliness religion. Some one says that Dirt, Debt and the Devil make the Trinity of Evil.

Says Dr. Playfair: "For a thousand years

after the civilization of the Egyptians, the Jews, the Greeks and the Romans faded, there was not a man or woman in Europe that ever took a bath. Hence arose the wondrous epidemics of the Middle Ages, which cut off one-fourth of the population of Europe: the spotted plague, the black death, the sweating sickness, and the terrible mental epidemics which followed in their train—the dancing mania, the mewing mania, and the biting mania. The monks made no little mischief, imitating the foul habits of the hermits and saints of early Christian times; and the association of filth with religion led men to cease to connect disease with uncleanliness, and to resort to shrines and winking virgins for cures of maladies produced by their own physical and moral impurities."

It was an Arab motto, "Renew thyself daily. Do it again and again, and forever again."

I suppose those "hermits and saints of early Christian times" were acting under the delusion that the more they mortified their flesh the more they deified the spirit; so they wore the hair-shirt until it was literally alive

with vermin; and it was not until the advent of the Moors into Spain, with their Mahometan habits of cleanliness, that Christian Europe learned the mistake it had made in so falsely interpreting the religion of Jesus. Indeed, it appears that modern Christianity has so largely occupied itself with the idea of self-chastisement that it has almost lost sight of the joy and sweetness which flow through all the life of Jesus, just as the old painters put only sorrow and suffering into their pictures of him, with never a trace of the joy which he must have known by the very consciousness of his own purity. In this spirit painted Guido Reni, who, it is said, actually stabbed the man who sat for his picture of Christ, in order that he might most vividly portray the agony which he, in common with all the old masters, made the dominant characteristic in the face of him who came to inaugurate the kingdom of love, joy, and peace. And so, to-day, the nearer a people are to the darkness and the errors and the gross superstitions of the Middle Ages, the less do they appreciate the good that lies all about us in the abundant outflowing of God's free air and water and joy-giving sunshine. It

is pitiful to note this in the large cities, where the degraded victims of the poverty which always goes hand in hand with ignorance and vice herd together in dens of darkness which reek with filth.

During a practice of several months in one of the New York dispensaries, where the poor get plenty of medicines and plenty of prescriptions from newly-fledged doctors, "without money and without price," I was again and again shocked, not only by the fear of water which prevails among this class of misguided beings, but also by the immense doses of medicine which they require to enable them to live without air and water. As a rule, they don't want any advice about living so as to get along without medicine, and they estimate the medical skill of their adviser by the amount of medicine given. No medicine, no brains!

I remember a very filthy woman who used to come every Saturday for pills. All the accumulated filth upon the surface of her body would defy description. As it was in the heat of midsummer, I ventured to propose that she take fewer pills for the inner self and more water for the outer self. In short, I copied

Mr. Dick's prescription for little Davy when his aunt Betsy Trotwood asked, "What shall we do with him?" "Wash him!" I wish there were any words by which I might picture for you the expression with which she asked me, "*What! all over?*" She then informed me that she had never done such a thing in her life, and should be ashamed to tell of it if she had. Medicine she must have. God's pure air and water and sunshine she was afraid of. I think I succeeded in getting the whole of that filthy body washed by inducing her to take it by installments. I gave her a half dozen powders of carbonate of soda, told her to dissolve one in a basin of water and apply externally until the whole body was thus medicated. The medicine (!) induced her to try this plan of ablution.

You will, perhaps, say this is an exaggerated case; but I assure you "such things are common." Even in my intercourse with young ladies in schools, to whom I advocate the daily ablution of the entire surface of the body, I am frequently met with the objection, "I cannot spare the time." And this, when five minutes are all that are required. A basin of

cold water, where the bath-tub is wanting, and two clean towels, with brisk action of the hands and arms, are all that are required. Let the whole person be denuded at once, and in cold weather let the work be done as briskly as possible. The tonic influence of such a bath in the morning (for the morning is the time for the cold bath, warm baths being indicated only at bedtime) will last all through the day, and is the best possible safeguard against "taking cold." If you are obliged to have a room-mate, a little ingenuity will enable you to improvise a screen. I hope the time will come when the putting two girls into one bed and one dressing-room will be recognized as an injustice to each. The present practice in boarding and other schools, in this respect, is pernicious.

Let it be understood that in giving these directions to young girls for daily ablutions in cold water, I assume that I address those in health. Invalids must remember that the family physician must be their guide in this matter.

An emphatic proof of the danger of stopping up the pores of the skin is afforded in

history by the case of the child whose skin was gilded to represent the golden age at the brilliant fete which celebrated the election of Pope Leo the Tenth. The child died in consequence of the application. Foucault, a French experimenter, covered animals with a coat of varnish. They died more quickly than if the whole skin had been removed. Horses had catarrh, dogs had congestion of liver and inflammation of bowels, and all died in convulsions.

Think of this, dear girls, when you are tempted to follow the example of those mistaken mortals who apply paints and powders and enamels to the face in order to appear beautiful (?) in the eyes of men. The late Dr. Edward Clark, in his most truthful book on "Sex in Education," has given you all the help you need to become beautiful, as follows:

"'When one sees a godlike countenance,' said Socrates to Phædrus, 'or some bodily form that represents beauty, he reverences it as a god, and would sacrifice to it.' From the days of Plato till now all have felt the power of woman's beauty, and been more than willing to sacrifice to it. The proper, not

exclusive, search for it is a legitimate inspiration. The way for a girl to obtain her portion of this radiant halo is by the symmetrical development of every part of her organization —muscle, ovary, stomach, and nerve—and by a physiological management of every function that correlates every organ; not by neglecting, or trying to stifle or abort, any of the vital and integral parts of her structure, and supplying the deficiency by invoking the aid of the milliner's stuffing, the colorist's pencil, the druggist's compounds, the doctor's pelvic supporter, and the surgeon's spinal brace."

"What is good for pimples?"

Water and work. Pimples indicate that there is an excess of something in the blood which the internal organs of excretion have been unable to dispose of, and they have called in the excretory power of the skin to their aid. If you take very little exercise and live indoors, it follows that you must also take very little food. You know what the result is if you keep putting coal on the fire and neglect to open the draughts. There can be no life in the grate nor in your body unless oxygen is supplied to each in proportion to the

carbon which is brought in. Your candies and sweetmeats are so much carbon, and you need a pound of oxygen per diem to burn up your carbon. In order to make sure of this daily pound of oxygen you must make your mus cles work in the open air. Take long, vigorous walks, and let the sun shine on you with his life-giving power. Find useful work to do!

Said an eminent Western lawyer, writing upon the subject of health reforms and reforms in general: "If I had supreme power, or could give one direction which should be followed, and would, in my judgment, do more than any other one thing to reform the world, and especially young ladies, I would say, 'Work!' I mean manual labor. Every man, woman and child should work. It is the idle ones who become the wicked ones. I do not recollect ever to have seen a downright industrious man or woman who was very bad; and it seems to me that a reform in this direction is more needed in the United States than anywhere else. All the American youth are contriving how to get a living without work, under the silly notion that work is disgraceful.

How clearly I can see that the Germans in this country are getting ahead of the natives! They pay their debts, and their families are almost all in comfortable circumstances. It is because they are willing to work.

"It seems to me that there is another decided defect in the bringing up and education of girls; and that is, that they are too superficial. They canter over a great variety of studies, get a smattering of each, and nothing is thoroughly mastered. 'To get on in life' means to be so much the master of your art that you make it for the interest of the world to employ you."

And he is right. Happy is it for each one of you who is dependent upon her own exertions for a maintenance. Work is the best of tonics and the best of beautifiers. The listlessness, the sallowness and the shallowness of her who has nothing to do but to try to look pretty are pitiful to contemplate. No less are you happy who, though not dependent upon your own labor for maintenance, have sought and found ways of work which call out your best powers. You are both out of danger of rusting, and, in large degree, you are out of

danger of falling "into the hands of the physician," as we read that he shall do "who sinneth against his Maker"; for it is the idle, and not the industrious, who are prone to vice. And all these principles of ethics are directly applicable to the question in hand. A lazy skin, which lacks the stimulus afforded by active exercise and by daily contact with air and water, is sure to be the pimpled and blotched skin.

"What makes freckles, and how may we get rid of them?"

Freckles are sun-spots, and the more actively you make the skin work and perspire the sooner they will disappear. Do not shut yourselves away from sunlight for fear of them. The best complexions are often the most sensitive to these sun-impressions, and you had far better wear a freckled skin than to look like the cellar potato-sprout, lank and pale and uncomely, for lack of sunlight.

"What are moth-patches, and what can one do for them?"

Moth-patches are allied to the fungi which one sees on the north side of buildings, where

the sun never shines. "Walk in the light" for them!

"What will make the hair grow?"

Water and air and light. The hairs are but so many appendages of the skin, and their health and vigor and luxuriance depend upon its health and vigor. Any excess of artificial applications to the head, which deprive its skin of air and light, lessen its vigor, and so tend to hasten the decay of its hairy covering. The head should be kept just as clean as the rest of the body, and the hair should have its ends clipped as often as once a month, else it soon comes to resemble the lawns which know not the lawn-mower.

Masses of dead women's hair, or of jute, or any foreign substance which heats and burdens the head, are not favorable to the health of the hair. It is marvelous how little regard is paid, as a rule, by young ladies to the style of the individual head and face in the choice of the style for the arrangement of the hair. A new style comes into vogue, and all at once, like a flock of sheep following the leader—the long-faced and the round-faced, the thin-faced and the wide-faced, the high-headed and

the flat-headed, the big-headed and the little-headed—rush to adopt it, utterly regardless of the question of fitness. I beg you, if you be lacking in a sense of the fitness of things, to choose from among your friends her who is most truthful and most competent to counsel you in this matter, and, above all other considerations, I pray you to put that of tidiness of arrangement first and foremost.

Finally, to quote once more from Mr. Emerson on Beauty: "It is a rule of largest application, true in a plant, true in a loaf of bread, that, in the construction of any fabric or organism, *any real increase of fitness to its end is an increase of beauty.*"

Also upon Behavior: "I have seen manners that make a similar impression with personal beauty; that give the like exhilaration, and refine us like that; and, in memorable experiences, they are suddenly better than beauty, and make that superfluous and ugly. But they must be marked by fine perception, the acquaintance with real beauty. They must always show self-control: you shall not be facile, apologetic, or leaky, but king over your word; and every gesture and action shall indicate

power at rest. Then, they must be inspired by the good heart. *There is no beautifier of complexion, or form, or behavior, like the wish to scatter joy, and not pain, around us.*"

CHAPTER XI.

THE USES AND ABUSES OF DRESS.

"The first purpose of clothes was not warmth or decency, but ornament.... The savage found warmth in the toils of the chase, or amid dried leaves in the hollow tree, in his bark shed, or natural grotto; but for decoration he must have clothes. Nay, among wild people we find tattooing and painting even prior to clothes. The first *spiritual* want of a barbarous man is decoration, as, indeed, we still see among the barbarous classes in civilized countries.... Clothes, which began in foolishest love of ornament, what have they not become to us!.... Clothes gave us individuality, distinctions, social polity. Clothes have made men of us; they are threatening to make

clothes-screens of us."—Thos. Carlyle ("Sartor Resartus").

Since man is the only wearer of artificial clothing—his natural covering being generally conceded to be insufficient for his needs—he has the privilege of choosing his extra suits from among the wardrobes of all the animals below him in the scale of creation. Looking about in his own sub-kingdom — that of the vertebrates—he finds little, if any, use for the scaly suits of the fishes, nor can he appropriate the feathered suits of the birds to any extent beyond that of ornament. Thus he finds himself, for the most part, restricted to the hairy and woolly quadrupeds for the materials which are destined to supply the deficiencies in his wardrobe.

History, in the records it gives us of the early Christian monks, tells us that Thomas a-Becket, and others like him, wore the hair-cloth shirt until it was a loathsome mass of vermin; that this example was imitated by the common people; and that the Saracens, about the eighth century, were the first to introduce into Europe "the often-changed and often-washed undergarment, which still passes among

ladies under its old Arabic name" (Dr. Draper).

Under such circumstances it is easy to see that the chemise was a godsend; but ten centuries have brought us a step further, and to-day the best-dressed woman is not the woman who wears a chemise. That garment has had its day. Reason and common-sense alike reject it and the hair-cloth garment which it superseded, while they substitute for its bagginess a neat and comely-fitting garment of wool which covers the entire body as if it grew there. It is not, like the chemise, gathered up into a superfluous mass of drapery round the waist, whose dimensions that garment needlessly increases; it is not, like it, forever slipping off one shoulder; and it does not, like it, leave the body exposed to the harsh vicissitudes of climate. On the contrary, it is everywhere adapted and fitted to the form; it cannot slip off one shoulder, for all hygienic laws require that the whole body be uniformly covered, the shoulders just like all other parts, and it shields us from sudden climatic changes as tenderly as it did the lambs from whose fleeces it came. The best thought of the day has been

devoted, in large measure, to this reform in woman's under-clothing, as well as to one in her outer clothing.

For years the gentlemen physicians have been uttering their protests against the abuses which woman was heaping upon her body by means of her errors of dress. What I have in previous chapters quoted to you from Dr. Willard Parker and Dr. T. G. Thomas, of New York, and from the late Dr. Edward H. Clark, of Boston—three names among the highest in the medical profession—are but a few of the many emphatic utterances upon this point.

But what could they do more? They never had to wear the abominable gear, and of course they were incompetent to criticise or amend it in detail. They could only reiterate, in a helpless way, what our gentlemen professors in the Woman's Medical College used to say as often as a woman came to the clinical lecture to be examined for chest or other diseases which required her disrobing, "Why will women tie so many miserable strings round their bodies!"

Meanwhile, the world was moving, and it had come to see that a man doctor was not good for much unless he was a good nurse.

So it finally came to think it possible that, since women were very good nurses without a medical education, they might be still better nurses with such an education, and the women began to go to Medical College. It only required one look at the internal mechanism of their bodies in the dissecting-room to show them the inevitable results of putting strings or bands or bones around these bodies; and so, little by little, out of their convictions, added to those of earnest, thinking women in Boston, there grew the *dress-reform* movement, which, like many other lights which rose in the East, has spread across the continent even to California, shedding its beams abroad in all the prominent cities of New England and many of the Western cities.

In New York city it has its headquarters only next door to that emporium of fashion, Madame Demorest's establishment, so that it really begins to look as if Fashion herself was preparing to become hygienic, and so common-sensible.

The principles of this reform are natural principles, and are concisely stated as follows:

"First—That the vital organs in central

regions of the body should be allowed unimpeded action.

"Second—That a uniform temperature of the body should be preserved.

"Third—That weight should be reduced to a minimum.

"Fourth—That the shoulders, and not the hips, should form the base of support."

Soon after the inauguration of this reform the prominent thinkers among the women of Boston and New York co-operated in arranging for a course of free lectures upon "The Effect of Misapplied Clothing upon the Health of Women," to be given by women physicians, simultaneously, in the two cities. The leading churches in both cities were placed at their disposal, and the press reported the lectures at length in the daily papers.

Thus was the leaven introduced into the immense lump of prejudice which still blinds the eyes of so many, many women. Some one has said, "There is nothing so painful to human nature as the pain of a new idea; it is, as the common people say, 'so upsettin'.'" You remember how I "upset" the woman at the dispensary to whom I ventured to suggest an

external application of soap and water to her entire person. I have to confess to you, even now, that it is almost as "upsettin'" to a woman to ask her to give up her chemise and drawers for a single, whole garment, which has all the uses and none of the abuses of the two, as it was to that poor woman to be asked to take a bath.

Yet I do not lose my faith in the ultimate success of the movement. All reforms must pass through at least three periods on their way to acceptation, namely: the stage of ridicule, the stage of abuse, and the stage of indifference.

Mr. Emerson, in his essay on Beauty, says: "Many a good experiment, born of good sense, and destined to succeed, fails only because it is offensively sudden. I suppose the Parisian milliner, who dresses the world from her imperious boudoir, will know how to reconcile the Bloomer costume to the eye of mankind, and make it triumphant over *Punch* himself, by interposing the just gradations."

Surely, ten centuries for the chemise is a warrantable gradation to its successor, the combination garment, which, in its varied nomen-

clature of "chemiloon," "chemilette," and "chemille," still retains enough of its Arabic etymology to give it the dignity of age. Nor is it by a sudden leap that we have come to this happy combination. The first gradation from the chemise toward it is to be found in the "pantalettes," which less than half a century ago were the only coverings worn by feminine legs, in their individual capacity, except the hose. These bantam-chicken attachments were tied around the leg, below the knee, by a string which fastened both them and the stocking, leaving the entire surface of the extremities from there to the waist exposed, except so far as the curtains hung about them, in the form of chemise and skirts, offered a show of protection. Think of wading through snow-drifts in that attire! Yet women did so, and it was considered quite the proper thing. The next gradation was from "pantalettes" to drawers, which are fastened about the waist by a band or a string, and which are now the rule in the feminine wardrobe, where they were the exception a quarter of a century since. Indeed, they are still the exception in some parts

of Germany and in secluded country towns in the United States.

Now, all that the dress-reform aims at is to combine the chemise and drawers in one garment which shall cover the body and its extremities like another skin, and thus dispense with any bands or strings either about the extremities or the body. By this means all superfluous folds about the waist are dispensed with, and thus its symmetry is preserved. Furthermore, all the interference with the circulation of the blood through its various channels is avoided; for it is impossible for this to go on as it should in any body which is girt about by bands, or whose extremities have strings tied about them tightly enough to keep either the hose or any other garments adjusted. An additional inducement to those who regard economy is the securing of one "piece," in place of two, for the laundry.

This one principle is adhered to in all the undergarments and in all the overgarments of the reform costume, namely: the unity which dispenses with waist-bands, instead of the duality which renders them indispensable, and thus puts restrictions upon that most important of

all muscles, the diaphragm. It asks you to do nothing, by way of change in costume, which shall make you grotesque, or even conspicuous, among your companions, except in the results which are sure to follow its adoption, by way of a fresher bloom on your cheeks, or clearer light in your eyes, and greater vigor to your whole carriage, than they can ever enjoy who persist in fettering themselves in ways which have proved, beyond all question, pernicious.

Of the close-fitting undergarments, there may be one of wool, worn next the person, of light and airy quality for summer, and of close, warm texture for winter. Over this may be worn a second, of cotton or linen, which can be ornamented at your discretion, and which can be so neatly and elegantly fitted to your person as to more than compensate you for the relinquishment of that instrument of torture and bane of woman's health—the corset. Hygeia, the goddess of health, admits no such foe to health as this into her wardrobe. There was a time when this horrible structure was even applied to babies and little girls. That day has passed, and, as a rule, modern mothers are accustomed to dress their little girls in

accordance with the requirements of health, and so in accordance with the design of the dress-reform. Let the world rejoice and take hope in the fact that some of them already see that the grown girl needs to make no change in the mode of applying her clothing when she steps from childhood to womanhood.

So much for the general principles relating to undergarments. For further details and for patterns you are referred to the various agencies already established in our principal cities. That in Boston is at 2½ Hamilton place. That in New York is at 6 East Fourteenth street. Other addresses or patterns may be obtained from these sources.

We come now to the consideration of the outer garments. Here the question is largely one of ornamentation; for the claims of comfort and decency are, for the most part, satisfied by the system of undergarments already advocated.

"We must have poetry and art in woman's dress; but poetry and art are never at odds with common-sense and vigorous health.... Fashion must be respected, so far as the painful impressions produced upon the eye by

marked and obvious departures from her arbitrary rules; but fashion is seldom a good physiologist."—*New York Tribune.*

The hygiene of dress does not demand the renunciation of drapery. The artistic eye will not yet accept even the masculine statue in trowsers, as proved by the outcry against the statue of Mr. Lincoln in the Union Square park, New York, and others of similar angularity, elsewhere located. Much less, then, will it tolerate either the feminine statue or the feminine personality divested of all the grace which it has come to associate with "robes loosely flowing." It only asks woman to bring her reason and her common-sense to her aid in the matter of the selection and adjustment of her attire, in conformity with the following considerations:

First, *health.* I cannot do better here than to call your attention to a sensible little manual entitled "Hints on Dress," by Ethel C. Gale, published in 1872 in the Putnam's "Handy-Book" series. This is what she says on the corset subject, under the *health* consideration:

"The idea that a disproportionately small waist is beautiful is one of the immature and

epidemic fancies of sweet sixteen. Once let it enter a school, and, in spite of physiology and the teachers, it spreads like the measles. Said an elderly gentleman one day, 'Where do the girls get such perverted notions of beauty? Here were my own daughters, never were taught anything of that sort at home, but when they returned from school they were drawn up in packs of torturing bones, till they looked as pinched and starved as weasels. Couldn't walk forty rods without fainting; couldn't take a long breath; couldn't laugh; couldn't do anything but look as miserable as if they were on their way to the gallows! I told the girls I'd disown 'em if they didn't take the things off; and so they did, and soon looked like themselves again.'"

Here follow some pertinent suggestions concerning the clothing of the feet, which you will do well to read and heed. There has been such a marked improvement in the matter of women's foot-attire during the last decade that they are inexcusable, to-day, if they allow their personal comfort or their health to be interfered with for want of suitably-made shoes or by reason of misapplied hose. The dress-reform

has perfected a mode of keeping the hose adjusted so that no bands, elastic or otherwise, are allowed, either on the extremities or about the waist. This disposes of one of the commonest causes of cold feet and *aching heads.* It also provides a shoe whose sole is shaped like the sole of the natural foot, and whose heel is so low and so broad that it cannot tip the wearer's spinal column from its natural line; thus disposing of one of the commonest causes of *aching backs.* French heels may fit French feet, and Chinese heels may fit Chinese feet, but the American woman had best wear home-made shoes.

You should also be mindful of the fact that the slipper should be limited to the dressing-room during cold weather. The change from the high walking-shoe to the slipper, for general home wear, leaves too much of the foot with comparatively less covering than any other part of the body, and is a common cause of *sore throats.*

Second only to *health* in importance among the essentials for being well dressed is *neatness.* Upon this point Miss Gale says, very aptly:

"We often see much-bedraggled clothes

worn by women who consider themselves entitled to be called ladies. But, in whatever circle she may move, we feel certain that the woman cannot be self-respecting who can trail a long skirt across a muddy street, entailing not only the ruin of the dress, but the certain bedaubing of stockings and underclothes, with which the soiled petticoats must come in contact.... Another point in which neatness is often offended is in wearing 'about house' shabby finery, rather than neater and plainer dresses. There are many who seem to imagine that, when wearing an antiquated, spotted, and even ragged silk, they are better dressed than when attired in something that, though whole and clean, is of plainer fashion and material. .... Infinitely better does a woman clad in a simple, but fresh and tasteful, calico, deserve the epithet well-dressed, than one attired in the most expensive materials, if these, by long use, or from any other cause, have become soiled or frayed.

"The same is true, in even greater degree, in regard to underclothes. The most elaborate needlework only adds to the disgust one feels if the garments it adorns are begrimed or torn;

while those of plainest fashion, if clean and whole, or neatly mended, are always pleasing to the eye.

"The third essential to good dressing is *becomingness.*

"One may be attired in the most healthful of costumes, and both person and every article of clothing may be in the most spotless condition, and yet shock the eye of taste.

"To be well dressed, one must always take into consideration the complexion, age, features and figure of the wearer, and the harmony of the different parts of the costume. Thus, the brunette cannot wear the delicate shades so beautiful for the blonde; and the woman of sixty becomes ridiculous if tricked out with the fluttering ribbons and bright colors appropriate at sixteen. The sylph who scarcely turns the scales at a hundred pounds cannot carry the flowing mantles which have become necessary to obscure the too-expansive outlines of the matron whose position in a carriage is sufficiently indicated by the condition of the springs. The woman whose sharp, hatchet-like features seem fashioned to hew her way through the world should not follow the Japanese style

of hair-dressing; nor should the woman whose head resembles a large red cabbage deck herself in big butterfly bows of scarlet ribbon, a jaunty little round hat, and a *chignon* emulating the proportions of the rotunda of our national capitol."

The fourth point to be considered is, "What we can honestly afford"; the fifth, "Our station in life"; and the sixth and last, "Our present occupation."

It will be quite obvious to you all, dear girls, that all these points are worthy of your faithful consideration; and let me exhort you especially to bear in mind that it is just as much your duty to your immediate family circle to *always* appear at breakfast neatly, becomingly and suitably attired as it is incumbent upon you to always look your best for the evening sociable; nay, it is a more imperative duty: for to whom do you owe such high honor as to the parents who preside over the home?

I find it not uncommon for young ladies t appear at breakfast-table with the hair in crimping-pins and curl-papers; and I always decide that if I were a young man in search of a wife,

I should turn my back upon all such girls as that. No woman should ever pour my coffee in the morning who would take more pains to look her prettiest for the evening caller than she would for me. That is what I should feel if I were a wife-hunter.

Let me further exhort you, dear girls, to keep the buttons and button-holes on your gowns in good working order. There is hardly one more common or more repulsive sight than that presented by a pinned-up gown, with here and there a button missing. I, as physician, have had some sanguinary experiences in this matter while trying to minister to the needs of fainting girls. Of course, when a girl faints I go for her corset-strings—for she who faints out of corsets is the exception—and I have more than once stabbed my fingers most woefully with these abominable pins, on my way to the corset-strings. Please bear in mind that this is your first service to be rendered on such occasions, namely: to cut the corset-strings. That is far more essential than to run for the camphor-bottle. The next service is to open the windows; the next is to sprinkle a few drops of cold water in the face; while all the

time you must send the curious away, and allow no one to remain in the room, or near the patient, to vitiate the air for her. Give her plenty of air and plenty of chest-room, and nature will do the rest, in most cases.

And now I have a word to say to you upon the subject of ear-rings. Do you not honestly think, down in your real hearts, that it is about as much a barbarity to punch holes in the ears for the setting of jewels as it is to punch them in the nose for that purpose? Yet you call yourselves *civilized*, and the nose-punchers *barbarous*. For one, I see no difference, except as a matter of taste, concerning which, you know, there can be no fair discussion, so capricious is that sense we name "taste"—the same sense which leads the women of one nation to tattoo the chin, while the men pierce the lips and insert a double-headed sleeve-button into the aperture.

We, Christians (?), punch holes in our ears and dangle bangles on our wrists, and send out missionaries to tell the people who are a score of centuries or more older than we that they are heathens, because they jingle bangles on their ankles and hang jewels in their noses!

We are wont to speak of the "heathen Greeks," but they never professed to believe they were created in the image of their most honored deity without striving to be like the same. They did not claim to be created in the image of the goddess Hygeia, and then seek, by hideous and unnatural contrivances, to destroy the harmony and symmetry of that image. They did not pray to be delivered from sickness and sudden death, and then rush into follies that are certain to bring one, if not both. They did not utter daily the words, "Lead us not into temptation," and immediately afterward rush into it. No, Hygeia stood ever to them as a beneficent divinity, providing against disease, rather than as a physician vainly attempting to cure that which should never have been contracted. She stood then, as she stands now, the teacher of the laws of health.

In Landor's "Imaginary Conversations" between some of these "heathen Greeks" occurs the following, between Aspasia and Cleone:

"Epimedea has been with me in my chamber. She asked me whether the women of Ionia had left off wearing ear-rings. I answered that I believed they always had worn them,

and that they were introduced by the Persians, who had received them from nations more remote. 'And do you think yourself too young,' said she, 'for such an ornament?' producing, at the same time, a massy pair, inlaid with the largest emeralds. 'Alas! alas!' said she, 'your mother neglected you strangely. There is no hole in the ear, right or left! We can mend that, however: I know a woman who will bring us the prettiest little pan of charcoal, with the prettiest little steel rod in it; and, before you can cry out, one ear lets light through. These are yours,' said she.... 'Generous Epimedea!' said I, 'do not say things that pain me. I will accept a part of the present; I will wear these beautiful emeralds on one arm. Thinking of nailing them in my ears, you resolved to make me steady; but I am unwilling they should become dependencies of Attica.' 'All our young women wear them; the goddesses, too.' 'The goddesses are in the right,' said I—'their ears are marble; but I do not believe any one of them would tell us that women were made to be the settings of pearls and emeralds.'

"I had taken one, and was about to kiss

her, when she said: 'Do not leave me an odd ear-ring; put the other in the hair.' 'Epimedea,' said I, 'I have made a vow never to wear on the head anything but one single flower, one single wheat-ear, green or yellow, and ivy or vine-leaves.... Our national dress, very different from the dresses of barbarous nations, is not the invention of the ignorant or the slave; but the sculptor, the painter and the poet have studied how best to adorn the most beautiful objects of their fancies and contemplations. The Indians, who believe that human pains and sufferings are pleasing to the Deity, make incisions in their bodies and insert in them imperishable colors. They also adorn the ears and noses and foreheads of their gods. These were the ancestors of the Egyptians. We chose handsomer and better-tempered ones for our worship, but retained the same decoration in our sculpture, and to a degree which the sobriety of the Egyptian had merely reduced and chastened. Hence, we retain the only mark of barbarism which dishonors our national dress—the use of ear-rings. If our statues should all be broken by some convulsion of the earth, would it be believed by future ages that, in

the country and age of Sophocles, the women tore holes in their ears, to let rings into, as the more brutal of peasants do with the snouts of sows ?' "

I beg you to note Aspasia's resolution "never to wear on the head anything but one single flower, one single wheat-ear, green or yellow, and ivy or vine-leaves," for neither art nor fashion ever has or ever can invent so appropriate an ornament for the human head as this.

Nor can all the combined efforts of Parisian perfumers ever supply you with any perfumes which you can so safely carry about you as those of natural flowers.

Be guarded, I beg you, in your use of artificial perfumes. Let them never be so loud as to be intrusive. Loud perfumes and loud costumes and loud manners generally go in company with each other, and each and all indicate a lack of that refinement which marks the real lady.

For special occasions you require special suits. For mountain climbing or for rambles by the seashore nothing could be better than the short flannel dress, with drawers to match.

For promenade nothing could be better than the Princess walking-dress, minus the train, with the neat and comfortable walking-jacket. The train is elegant in its place—in the spacious drawing-room or on the platform; but for a woman *en promenade* to be ever restricted to one hand, because her other is detailed to carry her train, argues a defect in her sense of "the eternal fitness of things."

Shawls are unfit for the promenade, because they restrict the free use of the arms in walking, and should be reserved for driving, where extra wraps are always needed. For the same reason the muff is objectionable as a part of the walking-costume, and should be reserved, with the shawl, for the drive.

There can be no real grace of motion for the woman who walks with her hands in a muff; nor does she secure that full expansion of the chest, and so that full benefit of a walk in the open air, which are insured when the shoulders are thrown back and the arms left to assist, as Nature meant they should, in the act of walking. We are but quadrupeds, privileged, by reason of very slight variations in the arrangement of our skeletons, to walk with

spines erect, instead of horizontal; but this erect position, while it enables us to look down upon most of the other quadrupeds after we emerge from the quadrupedal manner of progression with which we inaugurate our walk through life, by no means leaves us independent of our upper extremities for purposes of locomotion.

The sealskins and other skins which go to make muffs had much better be put into the form of gloves and mittens, and the same skins, which custom has wrapped about the throat, are much more needed about the feet and ankles than there. We invite many a sore throat by our pernicious habit of wearing furs about the neck till it is in a free perspiration from exercise, and then throwing them off in the church or other public place, so that the temperature is suddenly reduced. A pretty bit of lace or of ribbon or of knitted zephyr is as much protection as a young lady in good health requires, in our climate, about the neck.

Finally, I beg you to strive to dress in such quiet ways, when out on promenade, and on all ordinary occasions, that you shall not be conspicuous by reason of your clothes. It is aptly

said that the best-dressed persons in any assembly are those who have impressed us so much more by their good manners than by their good clothes that we cannot remember what they wore when the occasion is past. I have met young ladies in society and on the promenade who made a powerful impression of ruffles. I could never afterward recall anything above this overpowering sense of ruffles when thinking of them.

There is daily opportunity for you to exercise moral courage in this, as in the weightier details of life, by giving your preference to such modes of dress as are consistent with health and one's daily pursuits, rather than by following the idle caprices of fashion.

"Do you object to the morning wrapper in the breakfast-room?"

By no means. Only let it be clean and whole, and worn with clean collar and cuffs or ruffs, and with whole shoes. The shoes need not be as thick as the outdoor walking-shoe, but they had better be as high, for the cold weather. Above all things, do not wear shabby shoes, with the buttons off and the stockings exposed, either indoors or out.

I have seen this done with elegant morning wrappers; and the same ladies habitually appeared at breakfast with the hair in curl-papers or crimping-pins.

"But how shall we keep our hands warm without muffs?"

In the same way your brothers do: by warm mittens or gloves. You can get very nice seal-skin gloves for the money which a muff costs. I observe that the hand which carries the train never gets cold, even though covered only with a close-fitting kid glove—provided that glove be a "three-button" of the most approved shade.

"But what shall we do with all our pretty chemises?"

Get a pattern for the union garment, and make the chemises and drawers over. This is very easily done. Only summon up half the resolution by which you can manage to make over an old dress so as to make it appear new and "stylish," and the change is achieved by which you substitute "an ounce of prevention" for the pounds of cure which you will have to take if you persist in hanging skirts on your

hips and in buttoning or tying their bands about your waists. "Where there is a will there is a way"—and a *woman's* will, which is proverbial, both for determination and invention, ought not in so easy a matter to fail.

CHAPTER XII.

THE MATE AND THE HOME.

"O FORTUNATE, O happy day,
When a new household finds its place
Among the myriad homes of earth,
Like a new star just sprung to birth
And rolled on its harmonious way
Into the boundless realms of space."
—LONGFELLOW ("The Hanging of the Crane").

You have learned, in the foregoing chapters, that no single life, either of the plant or the animal world, ever fulfills its Creator's whole design. Such is the lesson of physiology. It matters not how simple the organism or how lowly the rank in the scale of creation, there is everywhere and always the dual element, the maternal and the paternal — these twain made one—supplementing and completing the individual incompleteness.

The rose is never a perfect rose until, by its marriage of stamens and pistil, its crowning work — the rearing of other roses — becomes possible. This is the end and aim of all marriage — the perpetuation of the species — and every new marriage implies a "new household." There is no moment in the whole life of a woman which is so big with possible joy or woe as that one which decides who is to be her mate in that "new household"; and if there is any one warning which I would impress upon your hearts and souls and minds with an emphasis which shall make it indelible, it is that you be not hasty or inconsiderate in making this decision. There cannot, by any possibility of accumulation of misery, come into your life so terrible a woe as that which results from a hasty, precipitate and rash marriage. The most forlorn "old maid" that lives now, or ever has lived, or ever will live, is supremely happy in comparison with her who, like the beetles in summer-time, has rushed headlong into the matrimonial flame and been singed for life.

As I have already told you, marriage is the ultimate end and aim of every life, and

the true marriage is the holiest of all possible relationships. It is of God's own ordaining. The true wife and mother is the queen among women—yea, among all created beings. All men honor her, and are ready to accord her the highest place in creation. Second only to her is she who has had the courage to remain single because the right man never came; for I am of those who believe that no woman is ever single, for her lifetime, for lack of the opportunity to marry at some time in her life; and whenever I meet an "old maid," I am ready to do her honor for living up to the principle, "*The best, or none!*"

Said a little girl, who has just said her "Seven times one," to me, "Auntie, what do you want I should be when I'm a woman?"

Said I, "I would like to see you just such a woman as your dear mamma, with a good husband and some very nice little children, all in a nice, pleasant home."

"Well," said she, "I'll get a husband if I can find a good one; and if I can't, I won't have any; would you, auntie?"

There, dear girls, is your motto for your matrimonial game. You can find nothing bet-

ter in the whole range of literature. "The best, or none!"

And what constitutes "the best"? First, and always, *the healthiest!* And who is the healthiest? First, and always, *the most temperate;* and *Temperance*, you remember, means *self-control.* The young man who smokes has lost his self-control. His appetite has run away with him, and it will carry him to other forms of intemperance just as surely as night follows day. Beware of him!

Temperance is personal cleanliness; is modesty; is quietness; is reverence for one's elders and betters; is deference to one's mother and sisters; is gentleness; is courage; is the withholding from aught which leads to excess in daily living; is the eating and drinking only of that which will insure the best body which the best soul is to inhabit—nay, Temperance is all these, and more

Let me tell you a true story. I know a man and woman who took a sudden fancy to each other upon their first meeting. They were both old enough to know better, but they rushed into matrimony, like two idiots, on a six weeks' acquaintance. Of course, they were terribly

disappointed in each other, and have been terribly punished for their folly. They had never heard of each other till they met; they knew nothing of each other's antecedents, nor anything of each other's personal habits, likes and dislikes, caprices or principles, or lack of principles.

The man is eleven years older than the woman, and is one of those who "enjoy poor health" to such an extent that they follow up every new disease until they know and experience all its symptoms. At one time he had five different doctors prescribing for him while he was attending to his daily occupation. He would take medicines by the wholesale, but was as averse to taking a bath as the woman, of whom I told you, in the New York Dispensary. He counted his pulse at every odd chance during the day, and looked at his tongue with a corresponding devotion. He believed that night air is a deadly poison, and that human beings should shut themselves indoors at sunset, all the year round; close all the doors and windows, and keep them closed till sunrise.

The woman was nineteen at the time they met. She had never known anything about

"poor health," and was quite unprepared to unite with this man in enjoying it. She had always been accustomed to her daily bath, and regarded every one as intolerably filthy who did not follow her example, for she was of a very intense nature, and what she believed she believed with an overpowering force which tolerated no dissent on the part of her immediate associates. In short, she was something, in temperament, like what is implied by the term "bottled lightning."

Their domestic life was very much like that of the cats of Kilkenny, as you may well suppose. She stormed, and took her baths, and opened the windows. He cried, took no baths, shut the windows, and called the doctors. There is no law of man's enactment for the punishment of such intemperance as they were guilty of, nor is any needed. They broke God's laws of the eternal fitness of things, and God has punished them in his own way; and they stand to-day, as do many others who have done likewise, as living examples of what men and women should not do.

I beg you all to take warning, and do not likewise. Do not trust yourself and your

whole future to one who attracts you simply by a fair exterior, but acquaint yourself with his personal habits, his family antecedents, his associations, his tastes and his distastes, his beliefs and his disbeliefs. Remember that the marriage contract binds you for life to one who is to be to you like another self, so close is the marriage relation, and you can no more get away from that other self, if he prove to be odious to you, than you can escape from your own self if you make yourself odious. There he must be, day after day, perhaps one of the "unwashed," with a breath horribly offensive, either by reason of his unwashed person or by reason of the use of tobacco or of rum, ever by your side, "till death do you part."

Ah, my dear girls, if you could only learn to look beyond the orange-blossoms far enough to see the rue which so soon succeeds them, in too many cases, you would learn to be duly cautious in this momentous matter. "The *best*, or *none!*" And do not trust your own unaided judgment, but give your whole confidence to your mother, or to her who stands in her place, if you be motherless; for the ex-

perience of twenty years or more is of untold value in a woman's ability to counsel you in this respect.

And even as you demand "*the best*" in the husband, so is it his to demand "*the best*" in the wife. The best man is he who will look wisely and well for his other self. To win him you must be worthy of him; and to be worthy of him you must be, like him, first of all, *healthy*, and temperate in all things in order that you be healthy. You must be *courageous* enough to resist every temptation to go in ways which your better self rejects, and to even be unfashionable, if to be fashionable means to do things which will conflict with God's eternal laws for your well-being.

You must be *self-reliant* and *self-controlling*, for the exigencies of married life call for these qualities in the highest degree. The hysterical wife may tempt the best man to "fall from grace," for he is mortal.

You must be *prudent*, in speech as in action; for to be prudent—provident—is in all respects opposed to thoughtlessness or heedlessness, or any intemperate word or deed. The wise woman "openeth her mouth with

wisdom; and in her tongue is the law of kindness. She looketh well to the ways of her household, and eateth not the bread of idleness. Her children arise up and call her blessed; her husband also, and he praiseth her" (Proverbs xxxi).

You must be *unselfish*. It is all very nice to be admired and courted, and to have him say fair and flattering words to you along with the bouquets and sweetmeats; but these are only so many little preliminaries. You might as well understand, in the beginning, that marriage requires the utmost unselfishness on both sides, and that each is to find his and her greatest happiness in giving, not in receiving. I have seen some sad instances of the grossest selfishness in homes where the one is always giving and the other is always taking. Sometimes it is the husband who gives his every thought and his every effort to an exacting, selfish, peevish and forever-discontented woman. The more he does for her happiness, the more unhappy she becomes, yet he carries himself serenely over all the ruggedness of her ways, and possesses his soul in patience. Such a man is but "little lower than the angels,"

and I have seen him. He is comely to behold.

And I have seen homes where the wife does all the giving. It is her daily and hourly study to so order her household and her surroundings as that the delicate sensibilities of her lord and master may never be jarred. Instead of carrying his half of the burdens of life, he puts both halves upon her shoulders, and she meekly trudges on, bending a little and a little more lowly as the years go on, and soon she will fall by the wayside, and he will never know why, for his thoughts are fixed wholly upon himself. He is the kind of man whom George MacDonald describes as "so sensitive that he shuts his ears to his sister's griefs, because it spoils his digestion to think of them." Yet he is a very proper man in the eyes of society, and very "respectable" in the way alluded to by the same writer when he puts these words into the mouth of Robert Falconer: "But one thing is clear to me, that no indulgence of passion destroys the spiritual nature so much as respectable selfishness." The man who is selfish in his own home, and with his own wife and children, was, beyond

all question, equally selfish with his mother and sisters before he had a wife; and so I say to you again, dear girls, observe how your young men treat their mothers and sisters, and guide yourselves accordingly.

"But you are terribly practical!" is the reflection which doubtless fills your minds while I hold your attention down to the details of every-day life, instead of painting for you fair pictures of ideal homes in cloud-land.

Dear hearts, you can build all the air castles without any of my help. You are at just the age when that kind of architecture prevails. And the more imaginative your temperament, the more of such castles you will build. You will have no difficulty in investing the handsome young man who paid you such flattering homage last evening, and who heaped his floral offering with still more attractive flowers of sentiment, with a halo which shall preclude all such questions as, Is he temperate? Is he unselfish? Is he clean, morally and physically and mentally?

That was the case with the unhappy pair whose story I have told you. Their vivid imaginations idealized each other to the utter

extinction of all common-sense. He was tall and handsome, and of honeyed sweetness of manner, and he took her out sailing by moonlight (the night air had no poison in it then!), and told her that the light of the moon and of the stars was dim compared with the light in her eyes, and that the blush of the roses he brought her was put to shame by the bloom of her round cheeks.

Of course she forgot to find out whether he washed himself once a year, or once in a lifetime, or never. She could never be so fearfully practical and unpoetical as that. But the orange-blossoms had not yet faded when she made discoveries even worse than I can tell you here, and which proved the assumption that unclean souls are most at home in unclean bodies. And he found out that the "eyes which put the stars to shame" could flash lightning at him in most terrific fashion. Alas! poor souls! If they only had listened to the practical promptings of common-sense, what a world of misery they would have escaped!

But I must not dwell longer upon the choice of a mate, and will assume that you

have chosen deliberately, wisely, and well. He is *healthy.* That is, he inherits, so far as you can learn from his family physician (for that is the one who should decide upon the fitness of parties for marriage), no scrofula, no consumption, and no insanity. He is *temperate.* That is, he neither eats nor drinks that which can do him harm, nor has he, by excesses of any kind, so weakened his digestion that he is obliged to smoke a cigar in order to digest his dinner. He is *clean,* physically and morally. He is *industrious,* else he must be vicious.

You are now, from this time onward, by all the love and honor which you entertain for each other, bound to order your lives in highest and holiest conformity with the one ultimate end and aim of marriage, namely, the establishment of "a new household," and the rearing of immortal souls. Do not, I beg you, rush into that fashionable, but fatal, error of getting married before your own nest is built and taking up your abode in another's nest, like the cuckoo, the thief among birds. The practice of marrying and boarding leads to more vice and crime than is known to any but

physicians. I, with only a limited experience as medical practitioner, can count a score of brides who have come to me to beg me to murder their unborn children, because they were "boarding," and it was not "convenient to have a family"! Most horrible of horrors! Most foolish of follies! Yet any physician can tell you the same terrible fact.

That "idleness is the parent of vice" is another fact which finds sad confirmation in the life of many a young woman who begins her married life in a boarding-house. She has nothing to do, as a rule, but to fix up in her new clothes and look pretty. After a time she fails to find satisfaction in being admired by one man; and as there are generally a half dozen idle men for every industrious one, it happens too often, sad as it is to relate, that she comes to court and receive the admiration of the six idle ones while her husband is engaged in honest labor.

Therefore, I say again, and always again, dear girls, do not be in haste to marry, for any reason whatever. The French proverb is no less susceptible of application here than elsewhere: "He who tires not, tires adversity.

All comes right to him who can afford to wait."

And while you wait, do not shut yourself away from air and light and all the joy which they insure, by mousing yourself up with a sewing-machine and making a pile of elaborately-decorated underclothing which will probably be of very little use to you after it is done. I have in mind a bride who, like many another, did that very thing; and when she put on the bridal veil, neither it nor the powder on the face could conceal the pale yellow tint of the face which was a stranger to air and sunlight. The elegant white silk was fitted to the last degree of smoothness over a waist which could be clasped with two hands, and the poor thing looked more like the bride of death than like a woman going to assume the sacred duties of a wife and mother.

In due time a poor, little, weak, white-faced boy came to her, who has never known what it is to be ruddy and strong and buoyant with fresh young life, and I fear he never will know. The poor, yellow-faced mother grows yellower every day, along with the useless underclothing which lies in the chests, and in whose fabrica-

tion she wasted the vitality which she ought to have secured for herself and her boy by going out daily in pursuit of it. Indeed, it is marvelous how it ever came to pass that a young woman on the eve of marriage should be expected to devote herself to amassing such supplies of underclothing as custom has made almost imperative; for nine out of ten who follow the custom will tell you it is mere folly, that the fashion of these things changes as does that of all outward things, and that they get tired of the old long before they can put it aside for the new.

Alas! how true it is, all through the life of woman, that it is her clothing which, more than any single cause, contributes to her physical, as to her moral, undoing! She who maintains her chastity none the less loses her health by her devotion to that capricious something which we call "fashion," and she who has bartered her chastity has, in most cases, been misled by the promise of ribbons and fine clothes.

The sewing-machine, which ought to be a blessing to woman, has been so sadly perverted, by the excesses in the way of ornamentation to which it has given rise, that it has proved a

curse, in that it has led to many forms of uterine and ovarian disease, and, in not a few instances, to the death of unborn children, whose mothers have ignorantly spent hour after hour at it in the fabrication of more than uselessly betucked and beruffled infant wardrobes.

It seems to me we but dimly comprehend, after all these centuries, what wealth of meaning Moses, the learned physician, had in mind when he told us that the making of clothing was the first result of that first yielding to temptation which led to the knowledge of good and evil. Shall we ever learn? Shall we ever regain the lost Eden? If we ever do, we shall surely approach it by the way of the perfect Home.

And where shall we find this home? This will be the first question for you and your chosen mate to answer, when you have each decided that you have chosen "the best." First, where, and second, what, shall the home be?

For location, I beg you avoid the heart of a great city. That is for business and for hotels and boarding-houses, not for homes. Choose,

rather, the companionship of green fields and vocal woodlands where modern transit conveniences insure ready access to all the advantages of the city, while, at the same time, you avoid its din, its dust, and its distractions. A homely counsel tells us that it is safe to build a home where a woodchuck digs his hole, for there you are sure of good drainage. Do not be afraid of climbing a hill. I suppose the forefathers were so imbued with the idea of getting shelter from persecution in all forms, whether ecclesiastical, aboriginal, or climatic, that they nestled together under the hills of New England, rather than on them, so that one is struck with their apparent disregard of the sanitary instincts of the woodchuck in noting how they established alike their farmhouses and their towns in valleys and beneath hills, where the sanitarian of to-day finds most favoring conditions for typhoid or malarial fevers, in defective drainage or in exhalations from low lands. It is curious to note, too, how the instinct for shelter extended even to the churches, and led to the building of close boxes for pews, with closely-buttoning doors to them; and even the minister was buttoned into

his pulpit, as if to keep him safe from the Indians.

But quite other foes than red men are "the foes of one's own household"; yet no less to be dreaded and shunned are these, when they take the form of bad air, insufficient sunlight, and defective drainage. Lift up your eyes, then, unto the hills, whence cometh your strength, when you look for the place where your model home shall be. Then plant no evergreens nor any other trees about your house where they can cut off your air and your sunlight, unless you want evergreens for a wall of protection from the north winds. The true sanitary home will have no living-rooms nor sleeping-rooms on its north side, but will reserve that for storerooms and for the refrigerator, and that is the only side where the evergreens are tolerable.

Then plan your house so that every room you occupy shall be a sunny one. You want a sunny dining-room, a sunny sitting-room, and sunny sleeping-rooms, and not one of these rooms should have a carpet or any furniture which is too good for the sun to shine upon. If you must have one of those chilling abomi-

nations known as a "parlor," with its darkness and mustiness and grandeur of upholstery, where formal calls are made, and where each party breathes a sigh of relief when the formidable task is accomplished—if you must have such a place of torture, it may as well be on the north side, with the refrigerator; but I beg you not to put me in it when I come to see you.

Your next care, after the insuring of free access of air and sunshine to all the inhabited parts of the house, will be directed to the securing of an abundant supply of pure water. The location of dwellings in low lands because it is easy to get water there is an apt confirmation of the saying that "lazy people take the most pains"; for the low-land dwellers are the best patrons of the doctor and the pill-man; and if they would work a little harder to get water on a height, they would be spared much of the labor expended in getting money with which to buy the "bitters" and pills which a residence in the low lands implies. If you are to depend upon well-water, you must bear in mind the following facts, which I quote from

"A Manual of Practical Hygiene," by Dr. Parker, of England:

"A well drains an extent of ground around it, in the shape of an inverted cone, which is in proportion to its own depth and the looseness of the soil. In very loose soils a well of sixty or eighty feet will drain a large area, perhaps as much as two hundred feet in diameter, or even more; but the exact amount is not, as far as I know, precisely determined.

"Certain trades pour their refuse water into rivers: gas-works; slaughter-houses; tripe-houses; size, horn, and isinglass manufactories; wash-houses, starch-works, and calico-printers; and many others. In houses, it is astonishing how many instances occur of the water of butts, cisterns and tanks getting contaminated by leaking of pipes and other causes, such as the passage of sewer-gas through overflow pipes, etc.

"As there is now no doubt that typhoid fever, cholera and dysentery may be caused by water rendered impure by the evacuations passed in those diseases; and as simple diarrhœa seems also to be largely caused by animal organic suspension or solution, it is evident

how necessary it is to be quick-sighted in regard to the possible impurity of water from incidental causes of this kind. Therefore, all tanks and cisterns should be inspected regularly, and any accidental source of impurity must be looked out for. Wells should be covered; a good coping put round to prevent substances being washed down; the distance from cesspits and dung-heaps should be carefully noted; no sewer should be allowed to pass near a well. The same precautions should be taken with springs. In the case of rivers, we must consider if contamination can result from the discharge of fæcal matters, trade refuse, etc."

I quote next from "The Sanitarian" an illustration of the results of a disregard of these precautions:

"A correspondent of the Massachusetts State Board of Health gives a sketch of the cellar of a house in Hadley, built by a clergyman. It was provided with an open well and sink-drain, with its deposit-box in close proximity thereto, affording facility to discharge its gases in the well as the most convenient place. The cellar was used, as country cellars commonly are, for

the storage of provisions of every kind, and the windows were never opened. The only escape for the soil moisture and ground air, except that which was absorbed by the drinking-water, was through the crevices of the floor into the rooms above. After a few months' residence in the house, the clergyman's wife died of fever. He soon married again, and the second wife also died of fever, within a year from the time of marriage. His children were sick. He occupied the house about two years. The wife of his successor was soon taken ill, and barely escaped with her life. A physician then took the house! He married, and his wife soon after died of fever. Another physician took the house, and within a few months came near dying of erysipelas. He deserved it. The house, meanwhile, received no treatment; the doctors, according to their usual wont, even in their own families, were satisfied to deal with the consequences, and leave the causes to do their worst.

"Next after the doctors, a school-teacher took the house, and made a few changes, 'for convenience,' apparently, for substantially it remained the same—for he, too, escaped as by

the skin of his teeth. Finally, after the foreclosure of many lives, the sickness and fatality of the property became so marked that it became unsalable. When last sold, every sort of prediction was made as to the risk of occupancy; but, by a thorough attention to sanitary conditions, no such risks have been encountered."

It is quite probable that the usual comments upon "the mysterious dealings of Providence" were made at the several funeral ceremonies which followed upon the several suicides above recorded, so habitual is it to attribute the consequences of such lamentable ignorance and stupidity to the God who

> "moves in a mysterious way
> His wonders to perform,"

when, if we would only look beyond consequences into causes, we should see that it is just as much a part of God's beautiful system of cause and effect that typhoid fever should ensue upon bad drainage as that a crop of wheat should reward the sower.

I recently heard a little boy commenting upon the death of one of his playmates, and this is the conclusion he arrived at concerning the cause of what the clergyman is wont to

call a "mysterious dispensation of Providence": "Mamma," said he, "I think I know why —— died. His mamma didn't know how to take care of him, and so God thought he had better take him home and take care of him himself."

It is difficult to see how any commentator could improve upon that conclusion. Alas! how few mothers do know how to take care of their children, and how few are capable of exercising that intelligent forethought which is necessary for the establishment of a successful "new household"!

We hear much about "the higher education of women" as a means of admission into the several professions which have hitherto been regarded as accessible only by men, and society is, for the most part, coolly awaiting, with folded hands, the result of their efforts at competition in these professions. The several stages of opposition and ridicule have been surmounted. Women have been through the same college curriculum with men; have taken diplomas from schools of law, divinity, and medicine; and are now on trial before a jury which differs vastly from the ordinary array of "twelve idiots," in that it represents, largely, the best thought of

the day. It is plain to all that, if a woman essays to perform any work which is not, from its very nature, purely woman's work, she must, for the time being, ignore all considerations except those pertaining to the best achievement: hence she must accept judgment upon the work itself, the worker being practically ignored.

For us, the question is purely and exclusively womanly; and for me, coming to you as a teacher of what you "ought to know," the way is as straight and as plain as God can make it.

There are some things which God has told women they are to do, and which none but they can do, and the teaching of those things belongs especially to the department of Physiology. It is for me, then, to endeavor to point out to you the way by which you may come most nearly to Wordsworth's standard of

> "A perfect woman, nobly planned,
> To warn, to comfort, to command,
> And yet a spirit still, and bright
> With something of an angel's light."

CHAPTER XIII.

THE PERFECT WOMAN.

"BE ye therefore perfect, even as your Father which is in heaven is perfect."—MATTHEW v, 48.

"Read the passage in its connection, and you will comprehend its meaning. Jesus has just been describing the Father in heaven as causing his sun to shine upon the just and upon the unjust; that is to say, in the conception of Jesus, God is perfect in proportion as he comes down, and not in proportion as he remains above; in proportion as he shows his favor to the worst, not in proportion as he exalts himself above the best.... The perfection of God consists in his communicating life to the smallest things, in his doing the most ungracious tasks for ungracious people, in his

drudging at enterprises that men think too unclean for their dainty fingers....

"The perfect life of Jesus—how was that expressed?....Great he was not, according to ordinary human standards. Socially he was not great. He was despised as the friend of the publicans and sinners; he was classed by the saintly people of his day among the 'come-outers' and infidels; because he talked in human fashion with a bad woman in the street he was considered no better than she.... Where, then, was his perfection? Simply in the fact that he could talk with the woman and not despise her; that he could go among the lowest, as one of them, without any word of scorn ever dropping from his lips; that he was not cold to any form of human suffering or misery....A great phrase in our time is 'self-development,' as describing the aim of perfection for modern men. But the merit of self-development depends wholly upon the quality of the self-hood that is developed. The development of a very cheap, tawdry style of self-hood is not noble....Self-hood does not consist in development above or beyond humanity, but in sympathy with it. Take our

own Emerson—that beautiful shaft of polished marble. How exquisite his mind! how finished his taste! how delicate his spiritual perceptions! how serene and self-absorbed his air as he goes along the streets! Yet Emerson is one of the most entirely human persons in the country: a patriot; a neighbor; a friend to the homely; a man who puts his name to good causes without questioning their popularity, and gives his strength to any work that is work for humanity; a man who has no shame to be seen walking side by side with the illiterate or the outcast if they are seeking the welfare of the common humanity which includes them both.

"We are fascinated by the fountain of water, admiring the crystal jet as it pushes up toward the skies, flashing in the sunlight; but it is the turning-point that makes the culmination of the beauty. It is when the column bends over, begins to fall, and, falling, disperses itself in drops of dew, clothing every blade of grass with diamonds, that the fountain becomes really beautiful." — Rev. O. B. Frothingham ("The Perfect Life").

Along with the much talking of "the higher

education of women" there goes much concerning "the perfect home." The world is waiting to refresh itself in that "perfect home," and it will continue to wait until "the perfect woman" comes, for she alone can create it. We have already an abundance of "pattern housekeepers," who fight dirt and flies and sunlight out of their houses with a persistency worthy of their Puritan descent. They tread round and round in their little peck measures of daily duty. They make very nice bread. They fry very nice doughnuts (?). They make very nice pies and pickles and sweetmeats (?). Their children are patterns of neatness and propriety; they never have soiled stockings nor soiled pinafores; they never make mud-pies, nor pick up dirty stones, nor handle "horrid bugs and worms," nor "litter up" the house with "weeds" from the woods.

Then, too. we have an abundance of the "Top-Lofty' style of women. They can write big books, full of big words, which one must study with dictionary in hand, as if they were written in a foreign tongue.

They can talk in profoundest style about "peripheral influences of an extremely power-

ful and continuous kind, which can set going a non-inflammatory centric atrophy, which may localize itself in those nerves upon whose centers the morbific peripheral influence is perpetually pouring in."

Some of them can "scold upon the platform" until "the planets shudder, shrink, and grow more rusty"; but among them all we yet look in vain for the answer to Solomon's question:

"Who can find a virtuous woman? for her price is far above rubies.

"The heart of her husband doth safely trust in her, so that he shall have no need of spoil.

"She will do him good, and not evil, all the days of her life.

"She seeketh wool and flax, and worketh willingly with her hands.

"She is like the merchants' ships: she bringeth her food from afar.

"She riseth also while it is yet night, and giveth meat to her household, and a portion to her maidens.

"She considereth a field and buyeth it; with the fruit of her hand she planteth a vineyard.

"She girdeth her loins with strength, and strengtheneth her arms.

"She perceiveth that her merchandise is good: her candle goeth not out by night.

"She layeth her hands to the spindle, and her hands hold the distaff.

"She stretcheth out her hands to the poor; yea, she reacheth forth her hands to the needy.

"She is not afraid of the snow for her household; for all her household are clothed with scarlet.

"She maketh herself coverings of tapestry; her clothing is silk and purple.

"Her husband is known in the gates when he sitteth among the elders of the land.

"She maketh fine linen, and selleth it, and delivereth girdles unto the merchant.

"Strength and honor are her clothing; and she shall rejoice in time to come.

"She openeth her mouth with wisdom; and in her tongue is the law of kindness.

"She looketh well to the ways of her household, and eateth not the bread of idleness.

"Her children arise up and call her blessed; her husband also, and he praiseth her.

"Many daughters have done virtuously, but thou excellest them all.

"Favor is deceitful, and beauty is vain: but a woman that feareth the Lord, she shall be praised.

"Give her of the fruit of her hands; and let her own works praise her in the gates."—*Proverbs* xxxi.

During all the centuries which have "dropped like grains of sand" from the hand of the Infinite since those words were first uttered, woman has been getting a little and a little nearer to this ideal type. She is making great strides, during this nineteenth century, toward the in-

tellectual requirements here set forth; but it is honestly questioned, by physiologists, whether she is paying that regard to that girding of "her loins with strength" without which all other acquisitions will avail but little.

The late Dr. Edward Clarke, when he gave her the fruits of his ripe experience and observation in his book called "Sex in Education, or a Fair Chance for the Girls," did more to recall her to a just and rational appreciation of her physiological position in Creation than has been done by any modern writer; and, so far as I know, the educated women physicians of to-day have, in the main, advocated his views therein expressed, in their efforts to induce women to respect the peculiar mechanism of their bodies, and to cease their attempts to stifle and ignore it. He says: "In all their work they must respect their own organization, and remain women... If we would give our girls a fair chance, and see them become and do their best, by reaching after and attaining an ideal beauty and power which shall be a crown of glory and a tower of strength to the republic, we must look after their complete development as women.... Physiology confirms the hope of the

race by asserting that the loftiest heights of intellectual and spiritual vision and force are free to each sex, and accessible by each; but adds that each must climb in its own way, and accept its own limitations, and, when this is done, promises that each will find the doing of it not to weaken or diminish, but to develop power."

Returning, now, to the consideration of Solomon's ideal woman, we find that the first essential is that she be "virtuous," and to be virtuous, in the purest sense of the word, is to be *strong*. "Virtue, Latin, *virtus:* strength, courage, excellence."—*Webster*. It is sad to acknowledge, as we are compelled to do, that the "virtuous" woman, in this literal sense, is the exception rather than the rule.

"She considereth a field, and buyeth it; with the fruit of her hands she planteth a vineyard."

This implies a practical knowledge of soils, and of agriculture; of geometry, of mineralogy, and of botany; of the comparative value, as well as the measurement, of land.

If the wives of those ministers and doctors and of the schoolmaster who fell victims to the

bad air of that Hadley house, of which we heard in the previous chapter, had been properly educated to do their share in the selection of a site for a house it is probable that their lives would all have been saved. You will notice that it was the women and children who died. You know it is the women and children who spend the most time in the house. The men have their outside lives, largely apart from the home and its belongings, and its sanitary conditions have, naturally, far less intimate relations to their health than they have to the physical well-being of the wife and children. Therefore, the "perfect woman" will know enough about soils and drainage and ventilation and water-sources and architecture to aid her mate intelligently in the establishment of their "new household."

I do not suppose that the second Mrs. Rev. ——, of Hadley, ever thought of asking why the first Mrs. Rev. —— died. Doubtless the Rev. Mr. —— gave her a proper funeral and a proper headstone, wore the crape of the proper width and for the proper length of time, while, at the same time with the wearing of the crape, the selection of the second Mrs. Rev. —— pro-

ceeded in proper manner. The selection being duly made, I suppose the second Mrs. Rev. ——, *in spe*, at once sat down and made a pile of new chemises. Probably she never looked at the cellar or the location of the well and waste-pipes of the house where she was to preside. So she went there and died, in her simple ignorance, as the doctor's wife and the schoolmaster's wife did, in theirs. "Providence" was credited with taking them "mysteriously." A little more light and air in the cellar cleared up the "mystery."

The "perfect woman" "girdeth her loins with strength, and strengtheneth her arms."

The ordinary woman "girdeth her loins" with corsets, and weakeneth her arms by folding them in a muff.

"She perceiveth that her merchandise is good: her candle goeth not out by night."

This may quite properly imply that she is so well educated in the varieties of merchandise that she cannot be swindled.

"She stretcheth out her hand to the poor; yea, she reacheth forth her hands to the needy."

The idle tramp cannot impose upon her credulity. She has the discretion requisite for

discriminating between the deserving and the undeserving.

"She is not afraid of the snow for her household; for all her household are clothed with scarlet."

It would almost seem that Solomon's prophetic soul projected itself over the centuries into the dress-reform rooms in Boston and viewed the red flannel, close-fitting undergarments which are beginning to take the place of white cotton curtains about the legs for snowy weather.

"She openeth her mouth with wisdom; and in her tongue is the law of kindness."

The "perfect woman" will be incapable of gossip or of slander, or of any interference with the domestic affairs of her neighbors. She will be so occupied with doing her own work well that she will have no time for "tea-parties" where tongues unused to "the law of kindness" are wont to make havoc of reputations. Of her neighbors' virtues she will be swift to speak, in society; concerning their faults she will be charitably reticent.

"She looketh well to the ways of her household and eateth not the bread of idleness."

Hence she will never have hysteria. All the doctors know that the hysterical women are those who have no care of house or children, and whose every thought is centered upon their own personal ease and happiness. The most unhappy woman in the world is the one who has nothing to do but be happy.

"Her children arise up and call her blessed; her husband also, and he praiseth her."

There is no jewel in Victoria's crown which can compare in luster with that jewel in her reputation whereby she shines upon her kingdom as a faithful wife and mother; and each one of you, my dear girls, may shine in your own kingdom, the home whose queen you shall be, with a luster which shall be reflected through all the ages beyond you. The character of its mothers decides the character of every people.

Every child that is born spends its first ten years with its mother, or with some woman who represents its mother. During those ten years its character is, substantially, formed.

"For the child, yet in native innocence, before his parents have become his serpents on the tree—speechless, still unsusceptible of verbal empoisonment, led by customs, not by words

and reasons, therefore all the more easily moved on the narrow and small pinnacle of sensuous experience—for the child, I say, on this boundary-line between the monkey and the man, the most important era of life is contained in the years which immediately follow his non-existence, in which, for the first time, he colors and moulds himself by companionship with others. The parent's hand may cover and shelter the germinating seed, but not the luxuriant tree; consequently, first faults are the greatest; and mental maladies, unlike the small-pox, are the more dangerous the earlier they are taken.

"Every new educator effects less than his predecessor; until at last, if we regard all life as an educational institution, a circumnavigator of the world is less influenced by all the nations he has seen than by his nurse."—Jean Paul Fr. Richter.

Who, then, shall dare to put limits to the "higher education" of a being who holds in her hands the destinies of the human race!

"Noverre only required from a good director of the ballet—besides the art of dancing—geometry, music, poetry, painting, and anatomy."

Shall a woman, who, by her influence over her son's first decade of existence, is to do more toward his final manhood than all the people and all the nations he is to encounter in after life—shall she limit her studies within narrower bounds than those assigned to the "director of the ballet"? No! let her climb to the highest heights of science; but let her always remember that she is designed to be a *mother* by a law of God which is stamped upon her being in characters which assert themselves to her, every hour of her life, from the time she passes from childhood through the portals which mark the entrance upon the age of potential maternity till she leaves those eventful thirty-five or forty years behind her!

"Her sex is the unalterable decree which she can cast no ballot to vote away from her, and assume no profession to raze it from the eternal tablets of her distinction. All the purely modern questions which relate to her career—the efforts to equalize with man's her wages, to multiply her opportunities, to claim her interest in the politics of human rights, to secure her alleviating presence in the rude scenes of republicanism — successful as these

tendencies may be, cannot transform woman; and she will not step out of her Shakspearean self. On the figured coast of his page her Essence stands, as yet without the right of suffrage, limited to household cares, or raised to queenly ones; as learned as Portia can become, but not yet admitted to the profession which she mimicked; provided for by the various dexterities of man, and still undriven by the modern threat of starvation into risking a single quality that is her birthright. There she stands: the modern world, stooping at her feet, will have to yield some of the reputed exclusiveness of men, but only such traits of it as Imogen, Cordelia, Beatrice, Portia, will select. In all this complicated period of overcrowded cities, over-stimulated competition, vices overfed, employees over-purse-proud, and politicians over-careless, there is no strait cruel enough to compel the essential woman to choose a career which would have unsexed one of Shakspeare's plays. I have no fear. Stand aside: cease that frantic bracing of the masculine back against so many doors of proscription. Throw them wide open, and let Shakspeare's stately crowd pass up and down to scan

the vista through them. Come, patient, chaste, obedient, high-spirited Imogen, too docile Ophelia, frank Perdita, warm Julia, bright and witty Beatrice, whose tongue is a pen already, or the etcher's tool; come, thou accomplished, grave, acute and self-possessed Portia; thou unsophisticated Miranda, who would fain share thy lover's toil; thou shifty, prompt Maria, hater of humbug; thou tender Viola—come, choose how many of these men's garments you will continue to wear, preferring to be women. Not one of them, I venture to declare, which your eternal instinct will feel to cramp or to disguise the form. 'Dost thou think,' says Rosalind, 'though I am caparison'd like a man, I have a doublet and hose in my disposition?'"
—Rev. John Weiss ("Shakspeare's Women").

"God is perfect in proportion as he comes down, not as he remains above"; and so will it be with the "perfect woman." She will have climbed to the heights of all the natural sciences, a knowledge of which is necessary in order that she may superintend her own domestic "sphere," and the more thoroughly she understands her business, the more ready will she be to "come down" from theory to prac-

tice. It is one thing for a pretty girl, radiant in white silk and roses and illusion, mounted on the rostrum before an audience in a fashionable schoolroom on graduation day, to expound the theory of the conversion of starch into sugar, and to cover the blackboard with formulæ which express the chemical changes which result from the mixing of flour and water and salt and yeast. She may go to the top of the "Bel Alp" with Prof. Tyndall and his twenty-five hermetically-sealed bottles of infusion of beef and turnips, and tell her audience all that Prof. Tyndall has told the world about "spontaneous generation," in connection with the yeast which is mixed with the flour and the water; and, by reason of her ability to do this, she may be marked "perfect" in the school rank-book; but unless she can "come down" from the rostrum to the kitchen, in a clean calico dress, and prove her theories by making some "perfect" bread, she is far from "perfect" herself.

The health of her entire "household," when she gets one, will depend upon her ability to "come down" to the minutest details of kitchen, laundry and nursery life. She may be so cir-

cumstanced that she need only superintend the work in these various departments of her "sphere"; but no one can superintend who has not first learned to execute. The quality of her bread and the *physique* of her children are the points whereon the reputation of the "perfect woman" rests for its support. If the bread and the children are poor and miserable and "slack-baked," they but reflect the same qualities from her who stamps her character on them. Jerry Cruncher, bear that he is, is yet on the truth's side when he grumbles at Mrs. Cruncher: "With your flying in the face of your own wittles and drink!....Look at your boy: he's as thin as a lath. Do you call yourself a mother, and not know that a mother's first duty is to blow her boy out?"

And so our fair graduate upon the rostrum may read her well-rounded dissertation upon the "Duties of Home," but unless she has acquainted herself with all those details of anatomy, physiology and hygiene which every woman must know before she can "blow her boy out" into a model man, she comes far short of "the perfect woman." She cannot, in justice to herself, nor to the children she is to

bear, omit the practical reading of that book "in which all her members are written"—the book of life. This should be read till its lessons stand out in letters of light, and with the assurance that, if disobeyed, they will turn to letters of fire! But she can never study this book of books by simply reading about it in printed books.

"Printed books," says the German, "are the spectacles through which the world is seen: good for weak eyes, it is true, but a free look at life keeps the eye healthier."

The physician, who assumes to know how to assist nature out of morbid conditions, must devote himself or herself, with the utmost fidelity, to the study of anatomy and physiology, before he or she can presume to know anything about diseases. Shall the woman who is to bear children and to nurse them during the years of helpless infancy be limited to a few printed books for the acquisition of the knowledge requisite for filling her "sphere," and never go to the dissecting-room to read nature's most impressive lessons? No! "The perfect woman" will know the anatomy of her body so well that she will respect it beyond all

possibility of abusing it, and so will she be fitted to bear and to rear *the perfect man* whom the world will be obliged to wait for till "the perfect woman" comes to bear him.

These, then, form the essential sciences necessary for the accomplishment of

"A perfect woman, nobly planned."

Nor can she dispense with a knowledge of literature, of history, and of the fine arts. There must be beauty in the "new household," and the "perfect woman" will know the difference between a highly-colored chromo of a long woman, in a long blue dress, clinging to a cross on a rock in mid-ocean, and a photograph of the "Sistine Madonna"; and her home will testify to this knowledge.

"A little music, too, we want.
In heaven the angels sing."

In the present uncertainty concerning "the music of the future," it is safe to say that she will prefer the music of Beethoven and Mendelssohn to that of more modern composers.

For forms of beauty in vases and all those accessories to a beautiful home where the children will be so happy that they would rather

be there than anywhere else, she will hardly be content with highly-colored paper mockeries of birds and butterflies and flowers gummed upon drain-pipes; for the photographer will have shown her what Greece and Rome have given us for beauty, where she cannot go to Greece and Rome to see for herself, and she will choose accordingly; while the children will be so guided by her in the study of nature that they will raise their own real butterflies and make their own collections of "sermons in stones," which will so occupy their minds that sermons for misdeeds will be unknown to them. There is no surer way of keeping boys and girls "in the way they should go" than by interesting them in the study of nature. "Nothing is beautiful but that which is true," and nothing is so true as nature.

Such are the main requisitions for your education as women.

"Women are by nature intended for people of business: they are called to it by the equal balance of their powers and their keen sense of observation. Children require an ever-open eye, but not an ever-open mouth; *claude os, aperi oculos.* But what circle of talking, which

always incloses only small and trifling relations, could so well exercise that ever-present glance as the circle of domestic affairs? Boys destined for certain occupations — to be artists, professors, or mathematicians — may dispense with a capacity for business, but never a girl who will marry—especially one of the above-mentioned boys.... If, now, a girl is intended to grow up with a clear eye for everything around her; if she is not to waste her many eyes in company, as Argus did his, by misplacing them, as painted eyes in a peacock's tail; or if she is not, like that sea-fish, the turbot, to have two eyes on the right side, but, in compensation, to be blind on the left—let her be many-sidedly exercised in household affairs; and the parents must not be disturbed if some admirer of an ethereal bride should object to her, as Plato reproached Eudoxus, with having profaned pure mathematics by applying them to mechanics; for to-day or to-morrow the wedding comes, and the husband, the honeymoon being past, kisses the mother's hand for all that the daughter does contrary to his expectation."—Jean Paul Fr. Richter ("Levana").

The time required for fitting yourself for this "business woman" for which Nature intends you is nothing less than your first twenty-five years of life. Your body does not acquire its full development in less than that time; much less do your powers of judgment attain their maturity. The great underlying cause of the painfully large majority of mismarriages and divorces which disgrace American life is to be found in the fact that our girls marry too young and on too short acquaintance. Some one has wisely said that "instead of making divorces more easy, we need to make marriages more difficult." No woman under twenty-five can assume the anxieties and responsibilities of the home and the nursery without a premature renouncing of the free and joyous life of a glad and buoyant girlhood. "Rejoice," O young woman, "in thy youth, and let thy heart cheer thee in the days of thy youth."

Even by so much as you are raised above the fish by being a warm-blooded creature with a diaphragm, by so much are you entitled to exercise that diaphragm freely by laughing along your first twenty-five years.

Says Jean Paul, also in "Levana": "I could write a whole paragraph merely in favor of cheerfulness and merriment in girls, and dedicate it to mothers, who so frequently forbid them. But seriously to assure girls they may laugh on suitable occasions would look very much like presenting them an opportunity of doing so. Mothers have much a habit of grumbling, even though they may smile inwardly; the daughters, on the contrary, generally only laugh visibly. The former have passed out of the triumphant church of virgins into the church militant of matrons; their growing duties have increased their seriousness; the bridegroom is changed from a honey-bird, who invited them to the sweets of the honeymoon, into a resolute honey-hunting bear, who will himself have the honey."

My final word is to you of "the triumphant church of virgins" who, like my little Daisy, of whom I told you in the previous chapter, will decide to have "the best, or none." Cheap husbands, like other cheap things, are always plenty, but good ones are scarce, and so it will be "none" for many of you.

The world has plenty of work for you, as

single women, after you have fitted yourselves to be perfect women. Nor is it a joyless work. Far, very far from it! If it be "more blessed to give than to receive," then, indeed, are you blessed among women by reason of the joy which you can give in ways in which that sister walked of whom Whittier sings:

"Next, the dear aunt, whose smile of cheer
And voice in dreams I see and hear—
The sweetest woman ever Fate
Perverse denied a household mate;
Who, lonely, homeless, not the less
Found peace in love's unselfishness,
And welcome wheresoe'er she went;
A calm and gracious element,
Whose presence seemed the sweet income
And womanly atmosphere of home—
Called up her girlhood memories,
The huskings and the apple-bees,
The sleigh-rides and the summer sails,
Weaving through all the poor details
And homespun warp of circumstance
A golden woof-thread of romance.
For well she kept her genial mood
And simple faith of maidenhood;
Before her still a cloud-land lay,
The mirage loomed across her way;
The morning dew, that dries so soon
With others, glistened at her noon;
Through years of toil and soil and care.

From glossy tress to thin, gray hair,
All unprofaned she held apart
The virgin fancies of her heart.
Be shame to him of woman born
Who hath for such but thought of scorn."

And so may each of you find

"peace in love's unselfishness,"

in many ways which I might detail; but as a teacher of physiology, it remains for me only to point you in the ways where Nature has put you by the unalterable decree of sex. The first of these ways, after that of the mother, is the teacher, and for this profession you need all the preparation which the mother needs, and even more, for you will have not only to supplement her work, but also to amend it in many ways where hers will be defective.

For this work you will need to fit yourself with the same fidelity with which your brother must fit himself for his profession; and when he goes to the *Technological Institute* to learn to be an *engineer*, you will go to the *Normal School* to learn to be a *teacher*. Do not, I pray you, offer yourself as a guide for other people's children without this preparation. If you do, you put yourself in the ranks of those

who hang out a doctor's sign without ever having made a study of the profession of medicine. Would you call a man to repair your water-pipes who had never studied plumbing? Would you ask a man to build you a house who has made no study of architecture? Will you trust your "house not made with hands" to a man or a woman who has never seen the inside of a human body, but who professes to be gifted with a supernatural "clairvoyance" which can dispense with all educational advantages and enable its possessor to step from the blacksmith shop and the herb-tea factory into the presence of death, with power to avert the dread monster's sway?

Will you assume that you can mould the plastic mind of a little child unaided by a love which is greater than mother-love—the love of a profession which calls for most faithful and accurate preparation?

The third place which belongs to woman by physiological decree is the sick-room; and even as she needs to be educated in all the ways I have indicated in order that she may meet the requirements of the first two of her physiologically-decreed "spheres," even more

emphatically does she need the education which the *Medical College* alone can give, if she assumes to cope with disease.

Mother, Teacher, Nurse, Doctor: either or all of these you may become, because you are women. For anything more—"What shall a Portia undertake to do? That which is level to Portia's capacity. *Must* she do it? That is as she herself may decide. But we let our women do the dirty drudgery of kitchens, expose themselves to the publicity of saloons, grow sallow and stooping over spindles, and spend all day dodging poverty behind a counter. We pay our money to see them exercise their various talents on the stage, where no exigency of the plot surprises us, no shifts of costume seem inappropriate, no want of it is amazing. Oh, we gentlemen are such sticklers for propriety, so interested to keep our women well sequestered! She must not speak in public, but she may sing. Jenny Lind's open mouth does not look indecent, but Lucretia Mott's is an outrage of our modesty! Where will you draw a line through the crowd of competent intelligences? I would draw it very quickly by putting cleverness in the place of dullness, though many a

preacher and schoolmaster, many a vapid lecturer, would have to budge. Why should inferiority in a swallow-tail be so valued and protected against superiority in skirts? Napoleon said, 'Careers are open to talents'; but he dreaded lively and gifted women, and got them out of the country, wisely suspecting that their insight would fathom his weakness. But no country can flourish till the talents and morals of women mix with its affairs. I cannot see why dullness is more respectable in a man than in a woman....Portia is quite competent to lead a single life, and might earn a brilliant living if fate stripped her of wealth. Being without a particle of ambition, she would have to be driven by poverty into setting up housekeeping with her gifts. But no woman is fine enough to persuade Nature to grant her exemption from the pain of love. There will always be exceptions—an Olympia Morata, a Cassandra Fedele, Florence Nightingale, Harriet Martineau, Maria Mitchell, Clara Barton—natures of great constancy, who are absorbed in scholarship, poesy, or good works, with a temperament that has an even graciousness toward all men, and just pauses short of honoring one

exclusively. Or, perhaps, the genius of such women was the gradual rally of time around an early disappointment, whose story never will be told; when something baffled a first love—as the pearl-oyster, stimulated by some foreign substance that has intruded into its retreat, slowly coats it all over with nacre, till beauty incorporates the secret ill. Man covets it, but can never fix the date when the trouble of a fine soul began to revenge itself so nobly."—JOHN WEISS ("Portia").

A final word to you, my dear girls of the Framingham Normal School, who have been oftenest in my thoughts while I have been writing these pages. Standing, as I do, in the relation of an older sister, who went out from this our *Alma Mater's* fostering care before any of you saw the light of life, it is with an almost maternal solicitude that I watch you from day to day and long to guard you from those sad consequences which I too well know must befall you if you neglect and abuse that body which is "the coat of mail and breastplate of the soul."

You can do and become all things which may become a "perfect woman" if you will but

learn, in the days of your youth, that all sickness and all suffering are the inevitable penalties of disobedience. "Be ye therefore perfect, even as your Father which is in heaven is perfect"; and as an example of what a single woman may become who makes this command the rule of her life, I can do no better than to point you to the beautiful presence whose judicious and loving care makes your school-life a daily proof that a woman can become as efficient, and yet as womanly, as a Principal of a Normal School as she can in the Home.

INDEX.

A.

A bad habit.....Page 107
About wells and typhoid fever.....219
About bangles..... 19
About the husband.....200
About people who use their muscles well....120
A criticism by Socrates.....105
Activity and oxygen.....130
Adam Clark's burnt-offering to the devil..... 40
A little more from Solomon..... 234
A little boy's philosophy.....223
A look beyond the orange blossoms.....205
Anointing of Juno and Venus.....153
An emperor's humor.....154
A pernicious fashion.....106
A remark from Jean Paul Richter.....237
A sunny house.....217
A sensitive man.....208
A sermon from the woodchuck.....216
A sick simpleton.....118
Aspasia and Cleone.....190
A twenty-eight mile viaduct.....151
A Western lawyer's advice 165

B.

Bands that are forbidden..... 63
Beautiful Greeks..... 87
Beauty and behavior.....169

Best brain food.....Page 101
Best hours for sleep.....128
Blossom and fruit.....136
Brain and nerves..... 97

C.

Carlyle on clothes.....171
Causes of disease.....142
Castles in the air.....209
Charmides and Minerva..... 34
Cheap husbands.....248
Cleanliness.....122
Clothing the feet.....183
Close-fitting undergarments.....180
Complementary colors.....186
Corsets.....182

D.

Dirt, debt, and the devil.....157
Diseases of women.....143
Doctors and women.....174
Doughnuts..... 46
Dress reform.....175

E.

Ear-rings and bangles.....189
Emerson on Beauty.....150
Epimeda's vow 192
Epidemics of the Middle Ages.....158

F.

Faded carpets or faded faces..... 93
Final words.....255
First corset.....188
Freckles and moth-patches.....167
Functions of the skin.....152

G.

Golden child.....163
Graham gems..... 52

H.

Heart and Cupid..... 54
Her Majesty's shoemaker..... 21
House of four stories.....146

How to drink, and what.....Page 38
How we breathe..... 68
How we ought not to breathe..... 70
How plants and animals are perpetuated.....134
How to boil potatoes..... 50
How women kill themselves..... 8
How to become beautiful.....146
How to be handsome old women..... 64
How the star-fishes do it..... 82
Horses, dogs, and orators..... 90
Hygiene of the skin.....156

I.

Introductory..... 5

J.

Jean Paul Richter's view of woman.....245
Jerry Cruncher's grumbling.....242
John Quincy Adams' habit.....156
Joel Benton on Apples..... 47
Juno and the turtle..... 15

K.

Know thyself..... 26

L.

Life of the protozoas..... 29

M.

Mate and the home.....199
"Mince-pie"-ty..... 51
Moist and sweaty feet..... 66
Modern troglodytes..... 96
More about respiration..... 72
Morning bath 162
Morning wrapper.....196
Most unhappy woman in the world.....236
Mr. Dick's prescription for little Davy.....161
Music of the voice..... 75

N.

Nature's sermon..... 94
Nerves and nervousness.....113

O.

Obeying Nature's laws.....145

Olympia Morata, Cassandra Fedele, Florence Nightingale, Harriet Martineau, Maria Mitchell, Clara Barton.....Page 253

P.

Pain of a new idea.....176
Perversion of the sewing-machine.....214
Phosphorus and matches..... 13
Platonic definitions..... 26
Poetry of dress.....181
Pork as a diet..... 62
Prayer of the nerves.....116
Pretty schoolgirl and the kitchen.....241
Pure water.....218

S.

Self-control.....206
Self-development.....226
Shadows on the wall.....108
Shakspeare's women.....239
Shawls and muffs.....194
Sickly Eves..... 6
Socrates' story of the grasshopper..... 84
Solomon's ideal.....229
Street-sweeping.....132
"Sublata causa, cessat effectus"..... 92
Successor of the chemise.....177

T.

The apple and its companions..... 61
"The best, or none!"..... 201
The cuckoo's nest.....211
The future undergarment.....173
The perfect woman.....225
The perfect woman esthetically considered..244
The unforgetful photograph.....110
Time to marry.....247
Tri-cuspid gates..... 58
Twenty-five years of laughter.....247
Two idiots.....202
Two kinds of women.....228
Two nervous systems..... 99

U.

Useless clothing.....Page 213

V.

Veiled enchantress.....111
Voltaire's miracle.....118

W.

What the perfect woman will know.....233
What dress reform aims at.....179
What will make the hair grow.....168
What Napoleon said.....253
What to eat, and how to cook it..... 42
What Dr. Edward Clarke said.....231
What causes cold feet..... 66
What Dr. Johnson asked his physician.....127
What causes varicose veins..... 64
What a Portia shall undertake.....252
What is good for pimples.....164
What woman's education should be.....238
What Thackeray said..... 78
What the Church of Rome does.....126
What Plato said..... 10
What marriage requires.....207
What causes palpitation..... 65
What Horace Mann said.....139
Whittier's dear aunt.....249
Why girls faint.....188
Why the Greenlanders eat candles..... 45
Woman's place.....251
Women of Shakspeare.....123

LIBRARY OF CONGRESS
00014415713